The contribution of simulation in the development of clinical judgement: Students' perspectives

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ABSTRACT

Clinical experiences are essential for the development of clinical judgement in nursing students. Clinical experiences offer students situated and contextual learning opportunities to apply their theoretical knowledge to patient care and make effective clinical judgements. However, students' learning opportunities vary widely in the clinical environment and this may influence their ability to acquire necessary clinical judgement skills. Further, access to clinical learning opportunities for many nursing schools is increasingly problematic due to limited clinical placements. In response, nursing schools are exploring simulations as alternative learning opportunities to support the development of clinical judgement in nursing students.

Research shows simulations are a valuable educational tool to prepare students for the clinical environment. They are especially useful as a practice environment that has no patient risk. There is also increasing evidence that simulations are helpful for developing clinical judgement. In nursing education, this evidence is based mainly on the evaluation of students' clinical judgement skills using the Lasater clinical judgement rubric (LCJR). However, other studies report nursing students are often anxious in simulations, they may find cue recognition difficult and they may struggle with the contrived nature of the simulation. The LCJR does not directly account for these contextual factors, therefore, a student's clinical judgement score in simulation may not accurately reflect their clinical judgement ability. As such, understanding the students' voice and their experiences in simulations is critical to designing an environment that enriches student learning, and ultimately the development of clinical judgement skills.

This exploratory case study investigated the experiences of third-year undergraduate nursing students in simulations and collected stories about their experiences in the clinical environment. This study places an emphasis on the student's voice. It aims to add to the ongoing dialogue about the potential use of simulation as an alternate learning environment to foster the development of clinical judgement in nursing students. To fulfil these aims, this thesis considered two research questions:

1) How do nursing students experience simulation as an environment for learning?

2) How do nursing students' learning experiences in simulation and clinical practice influence their development of clinical judgement skills?

The study employed a qualitative interpretative inquiry, involving: observations of simulations; one-to-one interviews; a collection of student stories from clinical practice; and the review of documents pertinent to the simulations. Twelve third-year nursing students participated in the study. The observation notes, interview data and clinical stories were analysed using a general inductive approach to categorise and derive key themes.

The study identified several themes that deepen our understanding of students' experiences in simulation and in the clinical environment to develop clinical judgement. First, students' perceptions of realism, comfort with role-play, preparation for the simulation, and collegiality and trust within their simulation group influenced their experiences in simulation. Accordingly, some students may find it more difficult than others to leverage the learning opportunities simulation offers. Second, there may be an unintentional effect of being observed in simulations, in particular, performance anxiety and a fear of making a mistake. In addition, separating the novice learner from the lecturer with the expert knowledge could overwhelm the student and make problem-solving difficult.

Third, students' learning experiences in simulation and clinical practice were very different; therefore, the environments provided different learning opportunities. In the clinical environment, students' felt a strong sense of responsibility for the patient outcome because they were working with real patients in real situations and they connected their learning to the emotions this induced. In comparison, simulations could feel less authentic, and, for some students, this made it challenging to connect with the learning. In the clinical environment, students had to respond in complex and unpredictable situations, whereas in simulations, the purposeful intent and end point of meeting learning outcomes meant the student's response had the potential to be predictable and formulaic.

In summary, a number of interlinking factors influenced students learning experiences in simulation. These included participant-related factors, facilitation of the simulation and the learning context. The experiences of these students are useful to consider when

planning simulation and clinical experiences to develop clinical judgement in nursing students.

PRESENTATIONS FROM THIS RESEARCH

Lesa, R. (2018). *The voice of the student in the design of a simulated–learning environment in education.* Presentation at the New Zealand Simulation in Healthcare (NZASH) Conference: Auckland, New Zealand.

Lesa, R. (2018). *Experiencing Realism in simulation: How important*? Presentation at the NZNO Annual Nursing Research Section Forum: Dunedin, New Zealand.

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Lesa, R. (2017). *Simulations and clinical: Like 'chalk and cheese'.* Presentation at the Student Research Symposium: University of Otago, Dunedin, New Zealand.

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CHAPTER ONE: INTRODUCTION

OVERVIEW

Nurse educators are preparing students for an increasingly complex healthcare environment. Factors such as aging patients with multiple co-morbidities, increased use of technological monitoring and complex titration of medications conspire to create a "high-stakes" and unpredictable healthcare environment (Benner, Sutphen, Leonard, & Day, 2009a. p.2). To adequately prepare nursing students to work in this environment requires the development of sound clinical judgement skills (Connell et al., 2016; Fisher & King, 2013). Clinical experiences offer students situated, contextual and experiential opportunities to develop their clinical judgement skills. However, students' experiences vary widely in the clinical environment. Studies show that factors such as the student-nurse relationship, time pressures, and the spontaneous occurrence of clinical presentations, influence learning opportunities (Brien, Charette, & Goudreau, 2017; Dahlke, O'Connor, Hannesson, & Cheetham, 2016; Ironside, McNelis, & Ebright, 2014). Access to clinical experiences for quality learning is also challenging for many nursing schools (Cassey, 2014; Lesa & Daniel, 2016; Wordsworth, 2013) In response, nursing schools are exploring the use of simulation to cultivate clinical judgement skills in nursing students (Hayden, Smiley, Heatherander, Kardong-Edgren, & Jeffries, 2014; Cant & Cooper, 2017).

This research highlights the student voice. It seeks to understand final-year nursing students' experiences in simulation and how these experiences compare to learning in the clinical environment. The focus is the development of clinical judgement in nursing students.

This chapter provides context for the thesis. It begins with the presentation of the researcher's background, highlighting interest in the research topic. The chapter then outlines the research questions and rationale for undertaking the study. A broad description of the context of undergraduate nursing education in New Zealand and the local setting for this study follows. The chapter concludes with an outline of the thesis structure.

RESEARCHER'S BACKGROUND

My professional life in the last 14 years has mostly involved educating student nurses in the classroom and clinical environment. During this time, I have witnessed many changes, but perhaps the most noticeable was a shift towards competency-based learning and its effect on my teaching role. When first employed as a nursing lecturer, I spent most of my working week in the clinical environment with the students. Teaching students in this environment provided many opportunities to cultivate students' recognition of clinical cues, interpretation of these, and discussions about nursing interventions and potential patient outcomes. Ten years on, my role had gradually shifted from coaching students in the clinical environment to checking if they were meeting the prescribed competencies set by the Nursing Council of New Zealand. It seemed my clinical visits were less about discussing the salient features of the student's clinical patients, and more about what the Nursing Council competencies mean, and whether the student could provide examples of meeting these. Around this time, I came across the book *Educating nurses: a call for radical transformation* (Benner et al., 2009a). The authors voiced concern that the current approach to teaching in undergraduate nursing education does not prepare nurses to work in the "complex, hazardous" healthcare environment of today (p. 1). Their call for a radical transformation in nursing education reflected my growing dissatisfaction with the changes I was experiencing in my education role. I began to question how I could cultivate clinical judgement skills in nursing students within the scope of my changing role.

My involvement with simulation commenced in 2007 when Laerdal's 'Nursing Anne'™ (a manikin designed for scenario-based training) was taken out of a cupboard to demonstrate heart and lung sounds. At the time, I was studying towards a qualification in teaching and learning, and I decided to explore how this simulator could be used in the clinical laboratory to teach clinical skills. With enthusiasm, I began attending simulation training and conference opportunities provided by the team at Laerdal New Zealand and, consequently, led the development of a simulation programme in the nursing school. By 2013, the nursing school had a two-room simulation suite and owned two high-fidelity simulators with advanced features, such as reactive eyes and pupils, tongue oedema, laryngospasm, cyanosis, and drug recognition. The nursing students participated in 15 simulations during their degree. The leadership team embraced this development and began to review how to incorporate simulation as a core teaching strategy in the

curriculum. However, for me, questions about the effective use of simulations were beginning to arise.

Two specific incidents led to this research inquiry. First, a student with excellent feedback from her clinical placements burst into tears during a debriefing session. When talking with her after this incident, she said she was losing confidence because she could not demonstrate her knowledge in this environment due to feeling extremely anxious. The second incident occurred in the simulation room. Towards the end of the scenario, the patient [simulator] was crying saying she did not want to go back to surgery. One objective of this simulation was for the student to provide comfort to a distressed patient. However, the two students stood back and hesitantly observed the patient. During the debriefing, we reflected on their reaction to the distressed patient to which they replied that comforting a manikin felt awkward. On personal reflection, I queried how learning in simulation influenced the emotional response of the students. Consequently, I became increasingly interested in students' experiences in simulation and how these compared to their clinical experiences.

THE PURPOSE OF THIS STUDY

This study places an emphasis on the student's voice. It seeks to understand the experiences of third-year nursing students in simulation. The study aims to add to the ongoing dialogue about the potential use of simulation as an alternative learning environment to foster the development of clinical judgement in nursing students. To fulfil these aims, this thesis considers two research questions:

1) How do nursing students experience simulation as an environment for learning?
2) How do nursing students' learning experiences in simulation and clinical practice influence their development of clinical judgement skills?

This study is important for two reasons. First, there is increasing evidence that simulation is an effective educational strategy (Adamson, 2015; Cant & Cooper, 2017). However, the majority of research related to simulations and clinical judgement has evaluated students clinical judgement (Bambini, Washburn, & Perkins, 2009; Chmil, Turk, Adamson, & Larew, 2015; Dillard et al., 2009; Strickland, Cheshire, & March, 2017; Yuan, Williams, & Man, 2014). Understanding how students experience simulation as a learning context offers educators an opportunity to design an environment that enriches

students' learning experiences and ultimately the development of clinical judgement skills.

Second, in 2014, the National Nursing Organisation (NNO) in New Zealand acknowledged that finding quality learning opportunities in the clinical environment for nursing students is becoming problematic. One recommendation was that alternative models of clinical education be developed and resourced to meet future health workforce needs (National Nursing Organisation, 2014). Nurse Educators in the Tertiary Sector (NETS) proposed investigating the possibility of substituting a proportion of clinical hours with simulations (National Nursing Organisation). To work towards this potential, NETS embarked on a project to develop standardised and validated simulation scenarios for nursing schools in New Zealand (Wordsworth, Pool, Hawes, & Holloway, 2014).

The results from NETS' initial survey to determine the most desired educational outcomes from simulations found nurse leaders in education and practice ranked clinical reasoning and clinical judgement as the two most important outcomes. This finding is not surprising because developing nursing students' clinical judgement is essential to prepare them for the demands of an increasingly complex and high-stakes clinical environment (Benner, et al., 2009a). However, clinical judgements are influenced by the context in which they occur (Tanner, 2006) and there are obvious differences between the simulation and the clinical environments. For example, simulations are deliberately designed, scripted, learner-focused, and provide feedback on performance targets for specific learning outcomes. In contrast, the clinical environment is patient-focused and student learning must come second. Further, in the clinical environment, patient outcomes are unpredictable, students face situations that require long-term planning to resolve, and there may be no clear resolution. Students may also receive unsolicited and informal feedback from patients and the inter-professional team. Moreover, in the clinical environment, the students' interaction with patients, families and the inter-professional team are real and can therefore be risky for both the student and patient. These differences between the simulation and clinical environments are illustrated in Table 1.

Table 1 Differences in the clinical and simulation environments

Dimensions	**Clinical Environment**	**Simulation environment**
Distinct characteristics	Patient-focused Student learning is secondary	Learner-focused Deliberately designed
Learning process	Informal opportunities from risky situations	Learning is often controlled for student and patient safety
Educational outcomes	Can be planned but outcomes often unpredictable	Learning is guided by specific outcomes.
Receiving Feedback	Feedback from team-members and patients may be unsolicited	Feedback is focused on performance and meeting learning outcomes
Fostering clinical skills	Learn on, and with, patients	Learn on, or with, simulators or actors

These differences in the simulation and clinical environments are likely to influence students' learning experiences and, consequently, their clinical judgements. Understanding how the simulation context influences the development of clinical judgement skills in nursing students can add to the dialogue about the potential use of simulation as an alternative learning environment.

The study employed a qualitative interpretative inquiry, involving: observations of simulations; one-to-one interviews; a collection of students' stories from clinical practice; and the review of documents pertinent to the simulations. Twelve third-year nursing students participated in the study. The observation notes, interview data and clinical stories were analysed using a general inductive approach to categorise and derive key themes.

DEFINITION OF TERMS

For the purpose of this research, the terms *clinical judgement* and *simulation* require defining. Simulation is a broad term which encompasses a range of modalities (type of simulation) and educational outcomes (Lesa & Daniel, 2016). Learning outcomes may focus on procedural technique, communication skills, or problem-solving and target psychomotor, affective or cognitive learning domains (Rooney, Hopwood, Boud, & Kelly, 2015). Modalities range from basic anatomical models, through to 'high tech' simulators and virtual realities (Decker, Sportsman, & Puetz, 2008). Chapter two will provide more discussion on the conceptualisation of simulation.

In regard to clinical judgement, in the nursing literature, the term is often used interchangeably with critical thinking and clinical reasoning (Victor-Chmil, 2013). Although these concepts are interlinked, these terms are not the same (INACSL Standards Committee, 2016a). Critical thinking and clinical reasoning are the processes involved in making a judgement, whereas clinical judgement is the outcome, conclusion or decision of the process (Victor-Chmil, 2013).

The two most widely published simulation glossaries are the Society for Simulation in Healthcare (SSIH) Healthcare Simulation Dictionary (Lopreiato et al., 2016) and the International Nursing Association for Clinical Simulation and Learning (INASCL) simulation glossary (INACSL Standards Committee, 2016a). Where possible, this study uses the terminology published by INACSL. There are currently three simulation-related definitions: simulation, simulation-based experience(s), and simulated clinical immersion. Clinical judgement, clinical reasoning and critical thinking are also defined. The definitions for these six terms are provided in Table 2.

Table 2 Definitions for Simulation, Clinical Judgement and Related Terms

Term	**Definition**
Simulation	"An educational strategy in which a particular set of conditions are created or replicated to resemble authentic situations that are possible in real life. Simulation can incorporate one or more modalities to promote, improve, or validate a participant's performance" (INACSL Standards Committee, 2016a, p. 45).

Simulation-Based Experience(s) (SBE)	"A broad array of structured activities that represent actual or potential situations in education, practice, and research. These activities allow participants to develop or enhance knowledge, skills, and/or attitudes and provide an opportunity to analyze and respond to realistic situations in a simulated environment" (INACSL Standards Committee, 2016a, p. 45).
Simulated Clinical Immersion	"A planned SBE in which participants are engrossed in a situation or setting as they would be if they were in the real world. The goal is to evoke or replicate life-like aspects in a fully interactive fashion" (INACSL Standards Committee, 2016a, p. 45).
Critical Thinking	A broad term that involves reasoning in and out of clinical settings (Alfaro-Lefevre, 2015). Critical thinking is disciplined, purposeful and goal-directed and based on evidence rather than assumptions or conjecture (INACSL Standards Committee, 2016a).
Clinical Reasoning	A process that involves cognition and reflective thinking to "gather and comprehend data," and recall knowledge and skills during an unfolding clinical situation. This information is put together to determine actions (INACSL Standards Committee, 2016a, p. 40). It is a specific term that typically refers to ways of thinking about patient care (Alfaro-Lefevre, 2015).
Clinical Judgement	An interpretation or conclusion about a patient's needs (Tanner, 2006) involving a series of decisions about whether to take action. "Clinical judgement is influenced by the individual's previous experiences, problem-solving, critical thinking, and clinical-reasoning abilities" (INACSL Standards Committee, 2016a, p. 40).

A simulation experience for the nursing students in this study involved participation in a clinical scenario with three or four other students. The simulation occurred in a dedicated room designed to resemble a hospital ward or outpatient clinic. The 1-hour learning experience included a 10-minute briefing, a 20-minute scenario, and a 30-minute debriefing session. Students were assigned one of four roles to play in the simulation: student nurse, registered nurse, relative, or peer observer. An actor or simulator (voice provided by a hidden lecturer or technician using a microphone) played the patient. A nursing school lecturer briefed the students, observed the simulation from behind a one-way window and facilitated the debriefing session, which included providing feedback to the students on their performance.

RESEARCH CONTEXT

To understand the experiences of the students in this study, it is necessary to provide some context in relation to undergraduate nursing education in New Zealand. This section provides a brief description of education requirements stipulated by the New Zealand Nursing Council (NZNC) to register as a nurse. It also introduces the nursing school in this study. Chapter three provides a more detailed explanation of the nursing school's simulation programme.

Undergraduate Nursing Education in New Zealand

In New Zealand, the Nursing Council sets the education programme standards and the requirements for accreditation of nursing programmes. To register as a nurse, students are required to undertake three years of full-time study leading to a Bachelor's degree and pass the final state examination. Currently, 17 higher-education institutions in New Zealand deliver undergraduate nursing education; 3 within universities and 14 in polytechnics. There are also two reasonably new graduate entry programmes leading to registration as a nurse. These Master's programmes require two years of full-time study.

The Education Programme Standards, published by the Nursing Council, provide detailed expectations about the provision of clinical experiences for nursing students (Nursing Council of New Zealand, 2015). These include the requirements that clinical experiences should be guided by well-formulated learning outcomes and that the clinical placement needs to be long enough to meet these outcomes. Each nursing student must spend a minimum of 1100 hours in the clinical environment. These clinical hours need

to include experiences in primary health, acute care (including medical and surgical), continuing care and mental health settings. Nursing programmes cannot include simulation as clinical hours. However, nursing schools are expected to provide all students with access to simulation learning resources to prepare them for clinical experiences and to ensure "the safety of health consumers, students and staff" (p. 11).

The Nursing Council also holds the responsibility of ensuring nurses are competent to practice. Accordingly, they prescribe the standards for the Registered Nurse (RN) scope of practice (Nursing Council of New Zealand, 2016). The standards include four domains of competence: professional responsibility, management of nursing care, interpersonal relationships, and inter-professional healthcare and quality improvement. To register as a nurse, the nursing student must demonstrate they meet these competencies. As a result, the nursing council competencies direct the nursing school's curriculum, course outlines and assessments. Nursing students are usually introduced to these competencies early in their education, and as they progress through the degree, they are expected to demonstrate how they are meeting these. To enable students to meet the registered nurse competencies, and prepare them to transition into registered nurse practice, all nursing students in New Zealand undertake an extended clinical placement of 360 hours (included in the minimum 1100 hours) in their final semester of study.

Educational Setting for this Research

An undergraduate nursing school of approximately 400 students provided the setting for this research. The main programme in the nursing school is a Bachelor of Nursing. The school also offers a competency assessment programme (for nurses who have not practised in the last five years or international nurses seeking New Zealand registration) and an enrolled nursing programme (second level nurse). The research participants were studying towards the Bachelor of Nursing. This programme requires three years of full-time study and leads to registration with the Nursing Council of New Zealand (NCNZ). As required by the NCNZ, the students spend 1100 hours in the clinical environment during their degree. These clinical experiences occur in a range of specialties, and in both outpatient and inpatient settings. Most of the students' clinical experiences were timetabled in the second and third year of the nursing degree. The nursing school mostly uses a preceptor model of clinical education. In this model, students pair with a registered nurse who acts as a mentor (Udlis, 2008). A lecturer from the nursing school visits the

students for an hour each week. During these visits, the lecturer conducts a formative assessment with the student in week two and a summative assessment in week three.

In regard to the simulation programme, students participate in 15 simulations during the 3-year degree. The simulations are designed to complement clinical courses and align with one of four clinical disciplines (primary health, mental health, medical or surgical). The primary purpose of these simulations are to provide students with opportunities to practise clinical scenarios in a safe environment. The word 'safe' means a "positive emotional climate" where participants are willing to take risks and make mistakes (INACSL Standards Committee, 2016a, p. 44). Consequently, students do not receive a formal grade for a simulation.

THESIS STRUCTURE

This thesis comprises seven chapters. This first chapter has provided the background context for the study. Chapter two provides an overview of the literature in relation to simulation and clinical judgement in nursing education. This chapter also considers the dimensions of clinical judgement, the conceptualisation of simulation, and, discusses the opportunities and challenges of using simulation to develop clinical judgement in nursing students. This discussion is followed by what is currently known about students' development of clinical judgement in simulation to identify unanswered questions and position this study in the body of simulation literature. Chapter three details the methods and methodology adopted for this study. It also describes how my ontology and epistemology shaped this thesis, ethical considerations, and how I sought to ensure credibility and trustworthiness in the research process.

Chapters four, five and six, present and discuss the research findings. The focus for chapters four and five is the students' experiences in simulation to answer the first research question, how do undergraduate nursing students experience simulation as an environment for learning? Chapter six presents the students' clinical stories to explore how their experiences in simulation compared to learning in the clinical environment. The focus is the second research question, how do nursing students' learning experiences in simulation and clinical practice influence their development of clinical judgement skills? The aim of chapter six is to consider the role of clinical experiences and simulation in developing clinical judgement in nursing students while also recognising the value of both environments.

Chapter seven summarises the key research findings, describes the contribution of this study and discusses the implications for nursing education. The limitations of this study are also acknowledged. The thesis concludes with recommendations for future research and personal reflections on this doctoral journey. Appendices offer clarity about the research process.

CHAPTER TWO: LITERATURE REVIEW

INTRODUCTION

This chapter provides a general overview of the literature in relation to simulation and clinical judgement in nursing education. The chapter begins with the dimensions of clinical judgement and then introduces Tanner's clinical judgement model, which provides the theoretical framework for this study (Tanner, 2006). Next, the chapter presents an account of simulation in nursing education, which includes a brief history of simulation in healthcare, a discussion of best-practice standards and a summary of the 'NLN/Jeffries theory' (Jeffries, 2016). This simulation theory provides constructs that have guided much of the simulation research in nursing education (Fey & Kardong-Edgren, 2017). The constructs in the NLN/Jeffries theory of participant and facilitator interactions, and the learning outcome of clinical judgment, are of particular interest in this doctoral thesis. This chapter also discusses the advantages and challenges of using simulations to develop clinical judgement in nursing students. The chapter concludes with what is known about the use of simulations to develop nursing students' clinical judgement and outlines unanswered questions in the literature that this study seeks to address.

CLINICAL JUDGEMENT

Clinical judgement skills are widely considered an essential nursing competency (Ibrahim & Aly, 2018; Lavoie, Cossette, & Pepin, 2016; Sommers, 2018). Clinical judgement refers to a cognitive process that involves the recognition of cues, interpretation of the meaning, an appropriate response, and reflection on the effectiveness of the intervention to adjust actions accordingly (Tanner, 2006). Nurses are often the first to recognise a change in the patient's condition because they provide bedside care. If a nurse fails to notice critical cues, such as a change in physiological status or behaviour, the potential for an adverse outcome increases (Kelly, Forber, Conlon, Roche, & Stasa, 2014). Therefore, a nurse's ability to recognise cues that suggest a patient is deteriorating and initiate a prompt response, influence patient outcomes (Massey, Chaboyer, & Anderson, 2017).

Fostering clinical judgement in nursing students is challenging because it requires theoretical knowledge and competence in procedural skills, assessment, clinical reasoning, and communication (Tanner, 2006). To support students' acquisition of clinical judgement, a range of educational strategies are therefore required. Examples include: didactic methods; textbook

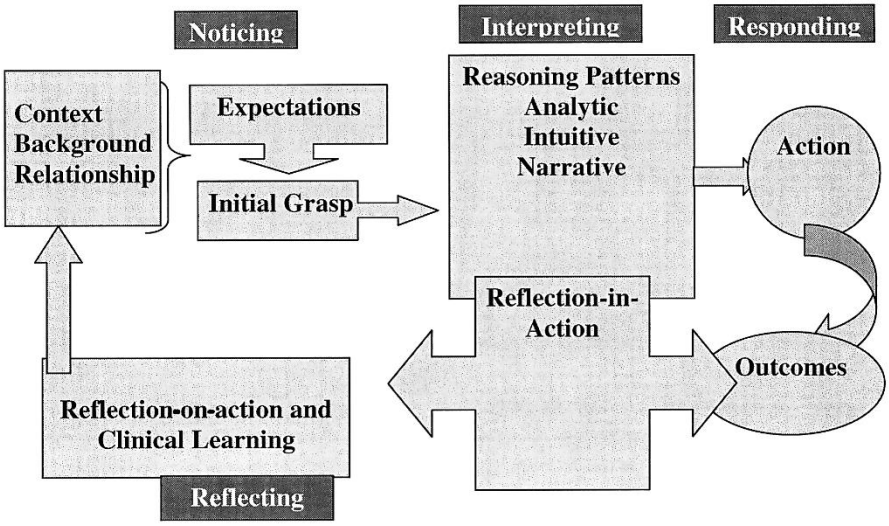
readings, or online activities to provide students with the necessary knowledge; sessions in the skills laboratory to develop procedural skills; and problem-based learning activities to promote clinical reasoning. Students may also watch videos, observe experts, write reflections and actively participate in clinical scenarios in a simulated setting (Ibrahim & Aly, 2018).

However, educational strategies in the classroom are insufficient to develop clinical judgement (Gaba, 2015). Nursing students also require clinical experiences so they can apply their theoretical knowledge to the reality of patient care (Jeppesen, Christiansen, & Frederiksen, 2017). Clinical experiences offer students' situated, contextual, experiential and rich learning on how to be nurses (Benner et al., 2009a). Caring for patients in the clinical setting also provides students with the chance to notice patient cues, interpret these cues, respond, and reflect on the outcome of their actions (Tanner, 2006). Further, skills in clinical judgement develop over time and by caring for a range of patients in a variety of clinical settings (Benner, Tanner & Chesla, 2009b).

Much of the theoretical work in this thesis draws upon the research of nursing theorists, Dr P. Benner and Dr C. Tanner. Benner's area of interest is how a nurse learns to *be* a nurse. Her early research drew on the Dreyfus and Dreyfus model of skill acquisition (Dreyfus & Dreyfus, 1980), to investigate the characteristics of nurse performance at different levels of education and experience (Benner, 2004). The findings from her research have laid the foundations for much of the current thinking about nurses' clinical judgements. Specifically, Benner concluded that a nurse's clinical judgements are not the result of a deliberate, conscious, rational choice of alternatives, but rather an engaged practical form of reasoning, gained from knowing the particular patient and their family (Benner et al., 2009b). Benner also argued that rational models of clinical reasoning—such as the commonly used nursing process (assessment, nursing diagnosis, planning, implementation and evaluation)—do not account for cultural and historical factors, or capture the influence of context, such as the nurse's involvement with the patient and family, or the role of intuition in clinical judgement.

Tanner's (2006) insights into clinical judgement are similar to Benner's. Based on the outcomes of two extensive literature reviews on clinical judgement (Tanner, 1998; Tanner, 2006), Tanner developed a model to describe the process of making a clinical judgement (Tanner, 2006). Figure 1 illustrates this model.

Figure 1 ***Tanner's (2006) Clinical Judgement Model***



In this model, Tanner (2006) illustrates four phases of clinical judgement; noticing, interpreting, responding and reflecting. Noticing can be seen on the left of the figure and it shows that the context of the situation, background and relationship with the patient creates expectations of a clinical situation and how this might play out. For example, by being in a relationship with the patient, the nurse comes to know the individual concerns and usual response of their patient to therapeutic measures. Tanner terms this "knowing the patient" (p. 206). The nurse also brings theoretical knowledge, past experience, knowledge of the clinical setting, and patient details (acuity, diagnosis) to the clinical situation. Tanner also explains that nurses approach a clinical situation with a "fundamental disposition" (p. 206) of what is right and wrong, for example, the nurse's view of excellent nursing practice and their values of what is important in the clinical situation. These values may affect how much effort a nurse puts in to understanding the patient's problem and whether the nurse believes they can intervene in the situation. All of these factors affect the nurse's initial grasp of the situation and consequently what the nurse notices.

The second phase depicted in Tanner's (2006) clinical judgement model is interpreting. According to Tanner, nurses use three different reasoning patterns to interpret a clinical situation and arrive at a clinical judgement: analytic, intuitive and narrative. The reasoning pattern the nurse employs depends on their initial grasp of the clinical situation. Tanner suggests nurses are likely to use an analytic reasoning pattern when the nurse lacks the required knowledge, has limited experience to draw on, or the situation demands an urgent response. This reasoning pattern involves breaking down the situation into its elements and generating

and weighing alternatives against the available data and likely outcome. Experienced nurses may resort to analytic reasoning when the patient outcome is unexpected, or when there are several possible responses to the situation (Benner et al., 2009b). Intuitive reasoning is sometimes referred to as reasoning without a rationale (Lasater, 2007b). It is characterised by an instant recognition of cues, patterns and trends because the nurse has experienced similar situations previously (Benner, et al., 2009b). This recognition enables the nurse to grasp the clinical situation quickly and interpret cues accordingly. The third type of reasoning, narrative, is when the nurse attempts to interpret the situation in view of the person's story. Working in a psychosocial model, the nurse assesses how patients and families are coping with the illness and how they will manage in the future. This assessment provides the nurse with a broad range of interpretations and responses, and assists them to respond to the patient in a sensitive and caring way. According to Tanner (2006), experienced nurses do not necessarily rely on intuition alone. Instead, they are more likely to combine reasoning patterns to confirm their emerging interpretations. The outcome of the nurse's interpretation is response, and this is depicted on the right of the figure. In this phase, the nurse "reads" (Tanner, 2006, p. 209) the patient's response to their interventions and if necessary, adjusts their actions to meet the expected outcome. Tanner terms this phase "reflection in action" (p. 209).

The final phase illustrated in Tanner's (2006) clinical judgement model is reflection on action. Reflection on action takes place after the nurse-patient interaction and, according to Tanner, usually has a trigger point, for example, a good or poor judgement. Reflection on action requires a supportive clinical context, personal skills in reflection and reflective habits (Benner et al., 2009b). Nurses also need to feel a sense of responsibility for their actions and have enough knowledge to connect their response to the situation, and with the patient outcome. Tanner's argument mirrors Schön's (1987) writings about reflective practice. In particular, the critical role reflection plays in the development of knowledge for professional practice.

Although Tanner (2006) undertook this research some years ago, it is still used extensively for both teaching and research purposes (Cappelletti, Engel, & Prentice, 2014) however, it is not definitive, and one should consider the limitations of the model. First, Tanner's model does not account for the influence of formal education on nurses' clinical judgements (Cappelletti et al., 2014). To be skilled in clinical judgement, a nurse requires an ability to identify which clinical cues are important, and know how to interpret the cues, how to respond and how to reflect.

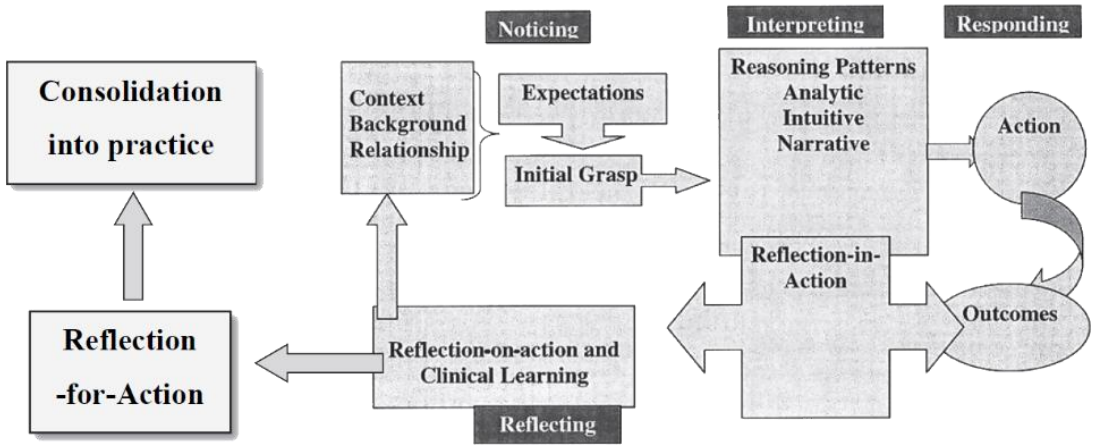
None of these skills are necessarily intuitive, but all are essential to making a clinical judgement.

Second, while Tanner's (2006) model is helpful in identifying the clinical judgement process of experienced nurses, it says little about the clinical judgement of novices. This limitation is important to consider because the reasoning process of a novice differs from that of an experienced nurse. Novices tend to rely more on rule-based thinking or guidelines to interpret cues and make judgements because they have limited knowledge and experience to draw on. Expert nurses can respond quicker to a situation because their knowledge and experience assist recognition of cues and informs judgements (Benner, 1984).

Another limitation of the model is that although it identifies reflection *on* action, it potentially undervalues reflection *for* action in future clinical practice. Reflection *for* action requires an openness to different perspectives or conclusions and may also necessitate developmental time and space for this to occur (Facione, Sanchez, Facione, & Gainen, 1995). If development time or space is lacking, or if the nurse is unskilled at self-evaluation or unwilling to consider other perspectives, then the capacity and motivation for reflection for action are likely to be affected (Facione et al., 1995). Time and space to reflect for action are particularly important in simulations because without this aspect, it could perpetuate a notion that learning is complete once learning objectives are achieved. However, for students, reflection on the simulation experience may not be complete until after the debriefing session when more space and time is available, or when a similar scenario occurs in clinical practice. Further, learning is not complete until it is consolidated into the nurse's future practice.

Figure 2 depicts a version of Tanner's clinical judgement model adapted to include reflection for action and consolidation into practice. The two added dimensions highlight that the development of clinical judgement skills in nursing students necessitates reflection on how to apply their learning to future contexts and that students must consolidate the outcome of their reflection into nursing practice.

Figure 2 An adapted model of Tanner's Clinical Judgement model (Lesa et al., 2018)



There is scope for further research into the application of Tanner's (2006) clinical judgement model in simulations. As discussed in chapter one, the simulation environment is different from the clinical environment where Tanner's model originated. Therefore, the students' expectations in simulation and in the clinical environment may differ because in simulation, the scenario is not real and the nurse-patient interactions occur in a short period of time. Simulations also lack critical social and relational cues, which may affect reasoning processes. Further, reflection after a simulation is directed by specific learning outcomes and occurs in a fixed timeframe. In the clinical environment, reflection may be student-driven, there may be more time and space for reflection, and there are opportunities to consolidate the outcome of their reflection into nursing practice.

The attraction of using Tanner's clinical judgement model in this thesis is the dimensions of noticing, interpreting, responding, reflection and consolidation into practice, provide a useful starting point and a language to explore students' experiences of developing clinical judgement in simulation and how this compares to clinical practice.

SIMULATIONS IN NURSING EDUCATION

As mentioned in chapter one, Nurse Educators in the Tertiary Sector (NETS) sent a survey to leaders in nursing education and practice in New Zealand to determine the most desired educational outcomes from simulations. Clinical reasoning and clinical judgement were ranked as the two most important outcomes (Wordsworth et al., 2014). Also mentioned was the current

interest in the potential to substitute a proportion of clinical hours with simulations (National Nursing Organisation, 2014). This section provides some background to this interest by offering a brief overview of the use of simulations in nursing education. It also describes best-practice standards and guidelines for implementing simulation programmes. An awareness of these standards and guidelines is important if one is considering substituting a percentage of clinical hours with simulations.

This section also presents the NLN/Jeffries simulation theory (Jeffries, 2016). This theory offers researchers a framework to understand the phenomena of simulation and provides a foundation to discover best practices in simulation. Of particular interest for this research are interactions between the participants and facilitator, and, the outcome of clinical judgement (Jeffries, 2016). This section concludes with the current challenges and opportunities of using simulation in nursing education and questions that still need to be addressed.

An Overview of Simulation in Healthcare

The use of simulations to educate healthcare professionals is not new (Schiavenato, 2009). Simulations were first introduced in healthcare education in the 1960s with Resusci-Anne™, designed for mouth-to-mouth ventilation training, followed by Sim One™ for anaesthetic training and Harvey™, a cardiology simulator (Cooper & Taqueti, 2008). According to Schiavenato (2009), the purpose of these early simulators was to help clinicians master technical skills and intricate tasks, such as surgery and anaesthesiology. Before their use in healthcare, simulations were used to train pilots, astronauts and soldiers by replicating the reality of the field (Issenberg et al., 1999). The basic understanding in these disciplines was that simulated exercises improved safety because participants could learn from their mistakes without causing harm to others. In recent decades, technology has continued to advance and, as a result, simulators are now highly sophisticated, and health professionals can practise clinical scenarios in surprisingly realistic simulated environments. Simulations are now widely used in health professional training to develop students' expertise in teamwork, therapeutic communication and clinical judgement (Jakobsen et al., 2018; MacLean, Kelly, Geddes, & Della, 2017; Strickland et al., 2017).

In nursing education, the expenses associated with early simulation technologies meant the uptake and acceptance of simulation as an educational strategy was slow (Harder, 2009). According to Harder, nursing programmes began investing in simulation programmes in the

1980s due to the emergence of advanced nursing roles that required new clinical skills and simulation resources became more affordable. Narrative accounts about how nursing programmes were using simulations first appeared in the nursing journals in the 1990s, which later progressed to evaluative studies of simulation practices (Harder, 2009). Since this time, the use of simulation has continued to thrive in nursing education and there is growing evidence to suggest simulations are useful for teaching psychomotor, affective and cognitive skills, such as clinical reasoning (Cant & Cooper, 2017; Doolen et al., 2016; Kim, Park, & Shin, 2016; Rutherford-Hemming, Lioce, Jeffries, & Sittner, 2016).

Conceptualisation of Simulation

The conception of what constitutes simulation remains a challenge for researchers. The difficulties with conception are likely due to the different modalities of simulation and varying purposes for its use (Lesa & Daniel, 2016). For example, intended learning outcomes may focus on procedural technique, communication skills, or problem-solving (Rooney et al., 2015). Educators may use a modality such as a basic manikin or task trainer to help students acquire clinical skills in airway insertion, nasogastric intubation or indwelling urethral catheter insertion. Students may practise cardiopulmonary resuscitation (CPR) on a resuscitation manikin and have their depth and rate of compressions evaluated on a CPR meter. Educators may also engage students in role play to help them practise communication skills or use 'high tech' simulators, virtual realities or variations of hybrid typologies to replicate clinical scenarios (Rooney et al., 2015). Therefore, it is not surprising Poikela and Teras (2015) identified 13 conceptualisations of simulation. Decker, Sportsman and Puetz (2008) described seven simulation modalities. These modalities are provided in Table 3.

Table 3 Simulation Modalities

Partial task trainers (low-tech simulators): Models or a manikin used to learn, practice and gain competency in simple techniques and procedures
Peer-to-peer learning: Peer collaboration used to develop and master specific skills
Screen-based computer simulations: Computer programs used to (1) acquire knowledge, (2) assess competency of knowledge attainment, and (3) provide feedback related to clinical knowledge and critical-thinking skills
Virtual reality: Combines a computer-generated environment with tactile, auditory, and visual sensory stimuli provided through sophisticated partial trainers to promote increased authenticity

Haptic systems: A simulator that combines real-world and virtual reality exercises into the environments

Standardized patients: Case studies and role play in the simulated learning experience; individuals, volunteers, or paid actors are taught to portray patients in a realistic and consistent manner

Full-scale simulation (medium to high fidelity): Simulation that incorporates a computerized full-body mannequin that can be programmed to provide realistic physiological responses to a practitioner's actions; these simulations require a realistic environment and the use of actual medical equipment and supplies

The phenomenon of interest for this research is students' experiences in a full-scale simulation (medium fidelity). The reason for this focus is twofold. First, full-scale simulations were offered in the nursing school accessed for this research. Second, practising clinical judgement requires a modality that offers students a chance to actively participate in a realistic clinical scenario. Understanding students' experiences in this type of simulation is important because although evidence shows simulations are useful to acquire clinical skills (Cant & Cooper, 2017; Doolen et al., 2016; Kim et al., 2016; Rutherford-Hemming et al., 2016), developing clinical judgement is more complex. This skill requires students to notice, interpret, respond, and reflect on their actions in a clinical scenario.

Simulation: Best-Practice Standards and Guidelines

Simulation societies provide a platform for training, collaboration, research, and dissemination of innovative simulation practices. Some of the most publicised on the internet include the Society for Simulation in Healthcare (SSH), the Australian Society for Simulation in Healthcare (ASSH), the New Zealand Association of Simulation in Healthcare (NZASH), the Society in Europe for Simulation Applied to Medicine (SESAM) and the Association for Simulated Practice in Healthcare (ASPiH). Specific to nursing is the International Nursing Association for Clinical Simulation and Learning (INACSL).

Societies such as these play an essential role in the development of best-practice standards to guide the use of simulations. For example, in 2016, ASPiH in the United Kingdom, published the National Standards Framework for Simulation-based Education. These standards highlight generally accepted best practice and reflect those of other societies (Purva & Nicklin, 2018). The following is a brief overview of the standards published by Association for Simulation Practice in Healthcare (2016):

1) Faculty should be appropriately trained, participate in professional development and be regularly evaluated by learners and other staff to ensure they maintain a safe learning environment and are competent in the process of debriefing. Also, technicians who support the delivery of simulations should be appropriately qualified.

2) Simulation programmes should be patient-centred and aligned with the goals, clinical needs, and curriculum of the institution. Further, the person overseeing the programme needs to ensure the simulations are regularly evaluated, peer-reviewed and kept up to date.

3) The intended learning outcomes of the experience should be clear and tailored to the professional curriculum. The learner should be supported, and if there are concerns about a learner's performance, this should be reported to ensure patient safety. Activities intended to develop procedural skills should include the relevant features of best practice. These include deliberate practice, mastery learning, feedback, curriculum integration, outcome measurement, skill acquisition and transfer to practice (McGaghie, Issenberg, Petrusa, & Scalese, 2010).

4) Simulation programmes should incorporate a variety of simulation modalities to create appropriate realism of the learning environment to achieve the objectives of the session. There should also be a strategic plan in place that addresses broader organisational and stakeholder needs and ensures maintenance of simulation resources. A designated simulation leader with organisational influence and accountability should be appointed to manage simulation activities.

For nursing education, two best-practice documents are particularly relevant and useful; the INASCL Standards of Best Practice: Simulation℠ (INACSL Standards Committee, 2016b) and the NCSBN Simulation Guidelines for Pre-licensure Nursing Programmes (Alexander et al., 2015). The primary purpose of the INACSL Standards is to advance and disseminate evidence-based standards for simulation practices to ensure quality and effective learning experiences and promote simulation research (Sittner et al., 2015). The INACSL standards provide a simulation glossary and seven best-practice standards (INACSL Standards Committee, 2016b).

1. Simulation design
2. Outcomes and objectives
3. Facilitation

4. Debriefing
5. Participant evaluation
6. Professional integrity
7. Simulation-enhanced inter-professional education

Each of these INACSL standards describes best practices for the design, implementation, and evaluation of the simulation experience. The standards are increasingly implemented in simulation programmes and for quality improvements projects and research (Sittner et al., 2015). In recognition that the science of simulation is continually evolving, the standards are published as a living document to provide space to add and revise as needed (INACSL Standards Committee, 2016b). The INASCL standards are referred to throughout this thesis.

The 'NCSBN Simulation Guidelines for Pre-licensure Nursing Programs' (Alexander et al., 2015) were developed to help governing bodies determine if nursing schools have necessary supports in place to substitute a proportion of clinical hours with quality simulations. They were published in response to concerns that the results from the NCSBN study (Hayden et al., 2014)—which found high-quality simulations could substitute up to 50% of students' clinical hours without compromising educational outcomes—may tempt nursing programmes to substitute a proportion of clinical hours with simulations before they were ready (Alexander et al., 2015). Included in these guidelines for pre-licensure nursing programmes are requirements that the nursing school must be committed to the programme and provide appropriate facilities, resources, and equipment to meet the learning objectives of the simulation. A nursing school also needs to have qualified teachers and laboratory staff to facilitate the learning experience, and all involved in simulations should understand the policies and processes in place.

While the primary goal of best-practice standards and guidelines is to improve simulation practices (Purva & Nicklin, 2017), the findings from recent research suggest establishing best practice in simulation programmes is challenging. For example, Beroz (2017) used the guidelines for pre-licensure nursing programmes (Alexander et al., 2015) to identify areas for faculty and programme development in the use of simulations. The findings from her survey of 27 programmes revealed deficiencies in simulation practices. Only 22% of programme coordinators had adequate numbers of trained, dedicated simulation staff and only 19% had orientation plans for staff development. Two-thirds of the respondents said they did not have

sufficient physical space and only 19% of simulation coordinators had a framework for the sustainability of resources. Further, only 22% of programmes had policies and procedures to ensure quality and consistent simulation experiences. Beroz concluded the infrastructure of many simulation programmes requires development to sustain the programmes as there were training deficiencies in simulation theory and best-practice standards.

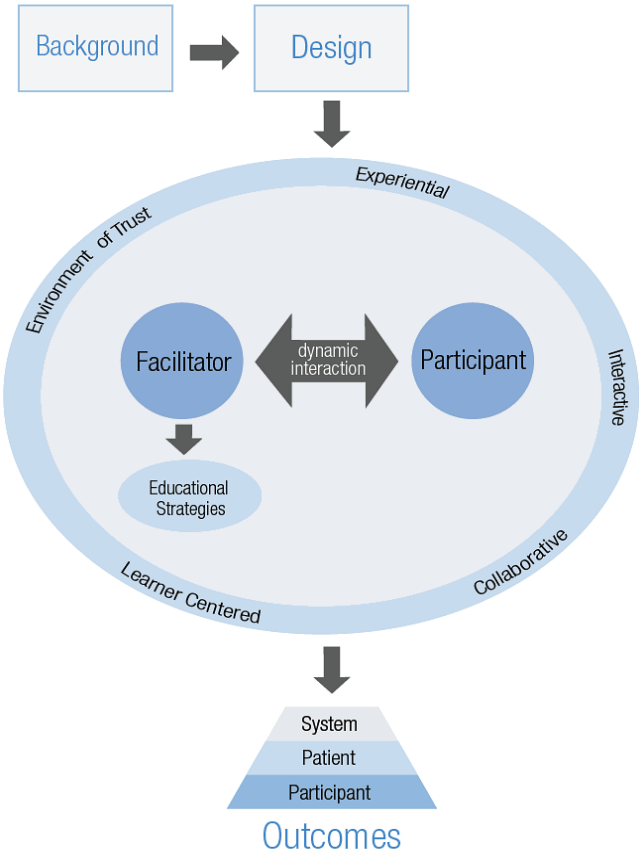
Research in both Australia and New Zealand reflects the findings of Beroz (2017) that resourcing and implementation of best-practice standards are challenging for nursing schools. For example, the results from a survey of nursing schools in New Zealand found a shared understanding of what constitutes simulation and of the extent to which simulation modalities (type of simulation) achieve learning outcomes was lacking (Lesa & Daniel, 2016). These authors also reported that while there is progressive ownership of different simulation modalities (ranging from task trainers to highly realistic simulators), the level of technical support and resources for these learning environments varies and in some nursing schools is lacking. Similarly, another survey of simulation in Australian and New Zealand undergraduate programmes revealed there are barriers associated with time for training educators and resource development (Bogossian et al., 2018) These authors also reported the process of simulation evaluation and quality assurance in nursing schools was weak.

The findings from these two surveys indicate nursing schools in New Zealand are not ready to substitute a proportion of clinical hours with simulations. To move towards this possibility, significant resourcing and further research is required to enable those involved in nursing education to implement best-practice standards and sustain their simulation programmes.

The NLN/Jeffries Simulation Theory

The NLN/Jeffries simulation theory (Jeffries, 2016) provides constructs that have guided much of the simulation research in nursing education (Fey & Kardong-Edgren, 2017). The overall aim of this simulation theory is to provide educators and researchers with a framework to understand the phenomena of simulation and provide a foundation to discover best practices in simulations. Since its initial conceptualisation (Jeffries, 2005), the concepts and variables have been extensively used and tested by various researchers and found to serve an important purpose in understanding the phenomena of simulation (Adamson, 2015). Figure 3 depicts this theory.

Figure 3 ***The NLN/Jeffries simulation theory***



The essence of the NLN/Jeffries simulation theory shown in Figure 3 is that the background context should guide the aim and design of the simulation. For example, the participants could be undergraduate students or expert clinicians, and this should dictate the complexity of the simulation, the level of support, and the location or use of resources. The simulation environment should be learner-centred and promote collaboration, experimentation, and interaction. There must also be trust established between the facilitator and the participant in the simulation. The attributes of the participant (age, preparation, level of anxiety, confidence, and role allocation) and facilitator (education, skill, preparation, conveyance of feedback, level of cueing and support) are likely to influence the learning experience, and these criteria need to be considered when planning a simulation. In addition, research outcomes from simulations should target the participants, patients and systems.

Most research to date has reported the effects of simulation on learner outcomes. These effects include knowledge gains (Cant & Cooper, 2017), the effect on self-confidence (Adamson, 2015; Pike & O'Donnell, 2010) and satisfaction with the learning experience (Lee & Oh, 2015). There is less research about the impact of simulation on health outcomes for patients, changes

in clinical practice and the cost-effectiveness of simulation (Adamson, 2015). This lack of evidence regarding the ultimate aims of simulation education is of great concern to educators and researchers in the nursing field (Cant & Cooper, 2017; Cantrell, Franklin, Leighton, & Carlson, 2017; Fey & Kardong-Edgren, 2017). Of particular interest in this thesis are the theoretical construct of simulation design, characteristics of the participant and facilitator, and the influence of these on the outcome of clinical judgement.

In summary, the science of simulation as a teaching and learning strategy continues to advance. The NLN/Jeffries simulation theory, best-practice standards and guidelines have built a foundation to support and promote simulation programmes. They enable stakeholders to determine expected actions by staff, the required technical support and resources, and the maintenance and sustenance of simulation programmes (Purva, & Nicklin, 2018). They also highlight that best practice in simulation requires infrastructure and substantial planning, which needs to be strategic in its approach, and stakeholders must be fully aware of what a commitment to simulation-based learning involves.

The Role of Simulation in Nursing Education

Nursing educators have used simulations for many years, however recently, interest in the role of simulation in nursing education has increased. There are three main reasons for this interest. First, educators are preparing students for increasingly complex healthcare environments, which require nurses to have sound clinical judgement skills. Second, practising on vulnerable, acutely unwell patients could be argued as both unsafe and unethical, particularly if there are alternative and equivalent learning opportunities available (Harder, 2018). Third, suitable clinical placements for quality learning opportunities are difficult to find (Lesa & Daniel, 2016) and, in response, there is ongoing dialogue about the potential to replace a proportion of clinical hours with simulations (see chapter one).

To inform these discussions, nursing regulatory bodies must first ask if there is sufficient evidence about the effectiveness of simulation to support this proposition. The most compelling evidence that simulations could potentially substitute a proportion of clinical hours is the results from the NCSBN study (Hayden et al., 2014). This large-scale, multi-site longitudinal study evaluated the educational outcomes of replacing a proportion of clinical hours with simulations. Nursing students (n = 666) from pre-licensure programmes across the United States were randomised into three groups. One group had 10% of their clinical hours substituted with

simulations (control group), another group had 25% and the third group, 50%. Clinical instructors evaluated the students using several validated and reliable data collection tools (Table 4) to measure students' satisfaction with the learning environment, critical thinking, competency, and readiness for practice during their education and up to six months after graduation (Hayden et al., 2014). The researchers in this study concluded that if the nursing programme designed simulations according to the INASCL standards of best practice (INACSL Standards Committee, 2016b), used a theory-based debriefing method, and formally trained staff, then high-quality simulations could substitute up to 50% of a student's clinical hours without compromising educational outcomes (Hayden et al., 2014).

Table 4 Data collection for the NLN National Simulation study

Data collection tool	**Time collected**	**Person completing the tool**
Creighton Competency Evaluation Instrument (CCEI): • 23-item competency evaluation (total score and 4 subscales	After each clinical course	Clinical instructor
ATI Content Mastery Series® examinations: • Computerized knowledge assessments	After each clinical course	Student
Clinical Learning Environment Comparison Survey (CLECS): • Ratings of traditional clinical setting and simulation setting to determine how well learning needs were met	After each clinical course	Student
End-of-Programme survey • New Graduate Nurse Performance Survey (6 subscales) • Critical Thinking Diagnostic (5 subscales) • Global Assessment of Clinical Competency; and Readiness for Practice (1 item)	End-of-Programme	Students Clinical preceptor/ Clinical Instructor
ATI RN-Comprehensive Predictor® 2010: • Computerized knowledge assessments	End of final semester	Student
Competency evaluation: • NCLEX®	7 months after graduation	Graduated student
Follow-up survey: • Nurse Performance Survey (6 subscales)	6 weeks, 3 months, 6 months after practice	Graduated student

• Critical Thinking Diagnostic (5 subscales) • Global Assessment of Clinical Competency • Readiness for Practice (1 item) (preparation for practice, length of orientation, charge nurse responsibilities, workplace stress)		
Manager survey: • New Graduate Nurse Performance Survey (6 subscales) • Critical Thinking Diagnostic (5 subscales) • Global Assessment of Clinical Competency • Readiness for Practice (1 item) Errors (2 items) Completed at 6 weeks, 3 months, and 6 months after practice	6 weeks, 3 months, 6 months after practice	Manager/clinical preceptor Graduated Student

Although the results from this study are encouraging, variations in the number of clinical hours required by licensing organisations make it difficult to transfer the findings to other educational contexts. For example, in the United Kingdom (UK), nursing students must undertake 2300 clinical-care hours of which 300 may be in simulations (Ricketts, Merriman, & Stayt, 2012). In Australia, a minimum of 800 hours of clinical experience is mandatory, not inclusive of simulation activities (Health Workforce Australia, 2014). In Korea, nursing students undertake a minimum of 1000 clinical hours of which 10% may be in simulations (Inatomi & Nomura, 2016). In New Zealand, the Nursing Council requires nursing students to spend a minimum of 1100 clinical hours in the clinical setting and simulations may not be included in this total (Nursing Council of New Zealand, 2015). Therefore, if nursing programmes in the UK replaced 50% of a student's clinical hours with simulations, students would still spend 1150 hours in the clinical setting. However, the same scenario in New Zealand would mean students would spend 550 hours in clinical practice and in Australia, only 400 hours. These differences in clinical hours have the potential to influence educational outcomes as the simulation and clinical environment are quite different (see chapter one).

Currently, evidence to show that educational outcomes will be similar if nursing programmes replace a proportion of a student's clinical hours with simulations is lacking. For example, a review of 92 simulation studies published between 1990 and 2016 (primarily in nursing

education) found that, although there is some evidence that simulations are an effective teaching strategy, whether the learning transfers to actual patient care is unknown (Cantrell et al., 2017). These researchers argued that while simulations provide the learner with opportunities to notice salient elements of clinical situations, it is still unknown if this increases capacity for clinical judgement. Adamson (2015) reached a similar conclusion about the transfer of learning and argued that one could not rely on students' performance in the simulation laboratory, feelings of satisfaction, or self-confidence, as sufficient evidence for the effectiveness of simulation.

Further, other researchers have reported mixed results about the effectiveness of simulations. For example, Lee and Oh (2015) undertook a meta-analysis of six studies and concluded learning with simulations 'might' have beneficial effects on the cognitive and psychomotor domains but not necessarily for the affective outcomes of self-efficacy and learning satisfaction. Weaver (2011) conducted an integrative literature review and reported there was mixed evidence about the effect of simulation on confidence because some studies reported an increase in self-efficacy and others revealed no difference in the students' confidence levels.

Given the challenges associated with resourcing, establishing best-practice standards, and, competing claims about the effectiveness of simulations, it is perhaps not surprising that, internationally, decisions as to whether to substitute a proportion of clinical hours with simulations appear to be made on a case-by-case basis (Breymier et al., 2015; Doolen et al., 2016; Larue, Pepin, & Allard, 2015).

Based on these findings, the priority for New Zealand nursing schools is access to funding to resource and establish best practice in their existing simulation programmes. Perhaps the most crucial question currently is not whether simulations can replace clinical hours, but rather how educators can use simulation effectively to develop nursing students' affective, psychomotor and cognitive skills. The focus for this research is the cognitive skill of clinical judgement.

Advantages and Challenges related to the use of simulations in nursing education

While there are some obvious benefits of using simulations in undergraduate nursing education, there are also several challenges that have the potential to affect students' experiences in simulations. This section highlights the advantages and challenges identified in the literature review.

Advantages

There is growing recognition that simulations are essential to prepare nursing students for the clinical world. The first reason, and perhaps most important, is simulations offer students a place to practise without the risk of patient harm. Students can also practise a skill or technique repetitively to achieve mastery before performing the skill on the patient (Clapper & Kardong-Edgren, 2012). Further, they can receive observation-based feedback on their technique to increase their competence (Larue et al., 2015). Another advantage is students can apply their classroom knowledge to a patient situation in an environment that is learner-centred as opposed to the clinical environment where student learning must come second to patient care (Jarzemsky, 2012). Educators can also scaffold the complexity of the clinical scenario according to the stage of the learner (Parker & Myrick, 2012). In addition, simulations offer educators the opportunity to demonstrate skill technique, role-model correct behaviours and provide expert assistance throughout the simulation experience (Zulkosky, Husson, Kamerer, & Fetter, 2014). Finally, educators may choose to use simulations as a formative or summative assessment of students' performance and competence (Starkweather et al., 2017).

Challenges

Four particular challenges associated with the implementation of simulations were identified in the literature review. The first relates to the enactment of a full-scale simulation that requires students to assess a clinical situation, respond and reflect. Challenges identified include the shortcomings of simulators to exhibit the full range of clinical symptoms which has the potential to influence the student's capacity to recognise cues and therefore, assess the patient (Dillard et al., 2009; Lasater, 2007b; Najjar, Lyman, & Miehl, 2015). Related challenges is that performing in front of their peers may heighten anxiety for some students and this may influence their response. In addition, large group sizes or unhealthy group dynamics may result in unequal learning opportunities to actively participate (Najjar et al., 2015; Parker & Myrick, 2012).

The second challenge identified in the literature was access to funding to provide full-scale simulations may be problematic for some nursing programmes; the required resources may also be underestimated (Al-Ghareeb & Cooper, 2016). Time-release for staff to learn how to use simulations as a teaching strategy and design simulations may also be unaccounted for (Akhtar-Danesh, Baxter, Valaitis, Stanyon, & Sproul, 2009; Miller & Bull, 2013). Further, the logistics of timetabling large numbers of students through simulations can be problematic

(Miller & Bull, 2013). Factors such as these may affect the capacity of educators to achieve best-practice standards for simulations and therefore, offer students' quality learning experiences.

Third, the argument that students can practise in simulations without risk of patient harm is persuasive and, as Harder (2018) argues, the question is not whether using simulations is valuable but rather, "what is the cost if we do not?" (p. 74). On the other hand, removing patient risk may mean the experience does not feel real for the students and this may affect their willingness to suspend their disbelief and play their assigned role in the scenario (Muckler, 2017). Most researchers in the simulation field agree that creating a realistic scenario is an important design feature to promote learners' suspension of disbelief and encourage active participation (Groom, Henderson, & Sittner, 2014). However, it is not yet fully understood why some students find it easier than others to suspend their disbelief (Muckler, 2017). Further, empirical evidence to show that suspension of disbelief is required to improve clinical reasoning is lacking (Kim et al., 2016). The importance of suspension of disbelief in a full-scale simulation needs further research because if a student finds this difficult, it may affect their capacity to actively participate and play roles (Baxter, Akhtar-Danesh, Valaitis, Stanyon, & Sproul, 2009; Najjar et al., 2015; Paige & Morin, 2015; Parker & Myrick, 2012), both of which, are a central aspect in simulations designed to develop clinical judgement.

Fourth, the opportunity to observe a student's performance and provide feedback to increase competence is one reason many educators use simulation (Larue et al., 2015). Observing a student's competence is especially relevant given the current emphasis on improving patient safety by ensuring health practitioners are proficient in practice (Gaba, 2007). However, research shows students may feel vulnerable in simulation because they are observed by their peers and a teacher. For example, words such as 'intimidating' and 'fearsome' have been used by some students to describe their simulation experience (Gantt, 2013; Lasater, 2007b). Other students said they commenced the learning experience with a "sense of foreboding" at the expectation of what was about to happen (Lasater, 2007b, p. 273). Tosterud, Hall-Lord, Petzäll, and Hedelin (2014) reported students worried about disgracing themselves, they feared exposure, and were apprehensive about ending up in a stressful situation. These researchers also reported students felt vulnerable in debriefing, regardless of group size. Similarly, Häggström et al. (2017) found students were uncomfortable being observed, feared judgement

and feared the unknown. They suggested that, for some students, overcoming reluctance towards simulation as a learning experience is a challenge.

Research findings also suggest learning in simulations may induce anxiety severe enough to interfere with learning. For example, Burbach et al. (2016) reported students could be so overwhelmed by anxiety in simulations they were unable to focus their thoughts. Shearer (2016) reviewed the simulation literature on anxiety and found performing in front of others produces anxiety, regardless of whether it was a summative or formative assessment. Likewise, Najjar and colleagues (2015) reported anxiety and fear were a "nearly universal part of students' simulation experience" (p. 3). These authors also found that as students progressed through the programme, they were more comfortable with ambiguity and therefore more prepared to engage with their peers and "embrace simulation as a safe place to make mistakes and learn from them" (p. 8). This finding warrants further exploration as it suggests preparation is an important influencing factor for learning in simulations.

While engaging in simulations might be anxiety-provoking for some students, learning under stressful conditions may also be beneficial. Therefore, a question common in many of these studies is, how much anxiety is too much? For example, the findings in a literature review by Al-Ghareeb and Cooper (2016) indicated that "anxiety could lead to poor performance, excellent performance, or have no effect on performance at all" (p. 488). Likewise, Fraser et al. (2012) concluded anxiety in simulations could either enhance or hinder performance. Thus a challenge for educators and researchers is determining the tipping point between stress that improves learning and stress that causes participants to be completely overwhelmed (Bong, Lightdale, Fredette, & Weinstock, 2010). It is therefore not surprising that educators hold different views as to whether inducing some anxiety in simulations to teach students how to cope with the stress of clinical practice is beneficial or should be avoided (Foronda, Liu, & Bauman, 2013).

In response to reports of anxiety and vulnerability, simulation educators are increasingly emphasising psychological safety in simulations (Ganley & Linnard-Palmer, 2012; Nielsen & Harder, 2013; Shearer, 2016). The word 'safe' means a "positive emotional climate where all participants feel at ease taking risks, making mistakes, or extending themselves beyond their comfort zone" (INACSL Standards Committee, 2016a, p.44). Strategies to foster a climate of psychological safety include orientating students to the environment, creating an atmosphere

of mutual respect and trust, ensuring confidentiality, and providing constructive, positive feedback (Rudolph, Raemer, & Simon, 2014). Setting expectations and goals during the pre-briefing is also recommended (Rudolph et al., 2014). However, based on the simulation literature that shows anxiety is almost a universal response in simulations (Najjar et al., 2015), one must ask if a safe emotional climate for all participants is realistic as some might find performing in front of others challenging despite every effort to make them comfortable. Table 5 outlines the advantages and challenges of simulation presented in this section.

Table 5 Advantages and challenges of using simulations

Simulations	**Advantages**	**Challenges**
Re-enactment of a clinical scenario in an environment without the risk of patient harm	Students can practise scenarios they may not otherwise see and practise skills not available to them on clinical practice Students can be actively involved by applying their classroom knowledge to a clinical scenario Students can collaborate with their peers to problem-solve	The shortcomings of simulators to exhibit the full range of clinical symptoms, may make cue recognition difficult Group structure may affect learning opportunities The potential for unhealthy group dynamics
Potential to use simulations as an alternative environment for clinical learning	Simulations may ease the student-load for staff in the clinical environment May increase the number of clinical placements available for student learning	Simulations are resource-intensive and accessing funding and allocating staff time may be challenging

Patient-risk is removed	Students can practise until they get it right without fear of patient harm	How real is the simulation for students? Struggling to accept the reality of the simulation impacts on participation Students may act differently in simulations and clinical practice
Preparation for the clinical setting	Educators can observe the students' skill development or management of a clinical scenario and provide feedback on the students' performance immediately, either by halting the scenario or during the debriefing Simulations may be an avenue for formative or summative assessment	Students may be reluctant to experiment with their ideas because they fear personal embarrassment Observation may cause anxiety which is likely to influence learning opportunities and also performance What one observes in simulation may not be an accurate reflection of the student's ability

Unanswered Questions

Recent authors have provided several suggestions for further research. For example, what is the best 'dose' of simulation across a curriculum, how does realism affect learning outcomes and which simulation modality is most useful to achieve specific learning outcomes (Fey & Kardong-Edgren, 2017). Fey and Kardong-Edgren also raised questions about the role of deliberate practice (intentional effort to improve something that you cannot do well or cannot do it at all) in simulations and what method of debriefing and facilitator training is most

effective. Norman (2014) and Adamson (2015) both suggested research is needed to explore the most cost-effective way to optimise the educational effectiveness of simulations. Lapkin & Levett-Jones (2011) questioned whether basic simulators may suffice to meet learning outcomes. This is an important question because high-fidelity (highly realistic) simulators are expensive. Several authors suggest a priority research area is the exploration of learning transfer from simulation to clinical practice and translational outcomes. In particular, there is a need to investigate how simulation can be best utilised to improve patient outcomes in the clinical environment (Cantrell et al., 2017; Doolen et al., 2016; Fey & Kardong-Edgren, 2017; McGaghie et al., 2016). Other areas of interest for simulation researchers include in-situ simulation (simulations undertaken in the workplace) to address patient safety threats in hospitals and features of effective inter-professional teams (McGaghie et al., 2016). Educaters are also increasingly interested in the possibility of substituting a proportion of a student's clinical hours with high-quality simulation experiences (Hayden et al., 2014; McGaghie et al., 2016). These unanswered questions clearly show there is scope to research students' experiences in simulation.

In closing, Nestel and Kelly (2018) provide 80 potential questions for researchers in healthcare simulation, some of which are relevant to this research. These include; under what conditions can simulation best support student learning and engagement for safe clinical practice; how efficient is simulation compared with other learning methods; and, to what extent can simulated learning environments replace clinical environments to support learning?

SIMULATION AND THE DEVELOPMENT OF CLINICAL JUDGEMENT IN NURSING STUDENTS

This section explores the literature relating to the use of simulations and the development of clinical judgement in nursing students. Two main themes were identified. The first theme was pre-briefing and debriefing are key educational strategies to promote students clinical judgement (Chmil et al., 2015; Lavoie et al., 2016; Page-Cutrara & Turk, 2017; Sabei & Lasater, 2016). Pre-briefing occurs just before the simulation experience and typically includes orientation to the environment, use of fictional contracts, role allocation and scenario introduction (INASCL Standards Committee, 2016e). Debriefing is led by a facilitator and takes place after the simulation experience. This session generally includes feedback on performance, reflective thinking, and discussion about the scenario (INACSL Standards Committee, (2016c).

The second theme identified in the review was that the majority of research related to clinical judgement in simulations used Lasater's clinical judgement rubric (LCJR) (Lasater, 2007a) to evaluate and score students' clinical judgement. This section presents these findings in three subthemes; pre-briefing, debriefing and Lasater's Clinical Judgement Rubric.

Pre-Briefing

Pre-briefing is common practice in simulation design (Chimil et al., 2015; Lasater, Johnson, Ravert, & Rink, 2014; Page-Cutrara & Turk 2017). The primary aim of pre-briefing is to establish a psychologically-safe environment by orientating students, introducing the scenario, and setting ground rules and expectations (Rudolph et al., 2014; INASCL Standards Committee, 2016e). While pre-briefing strategies such as these are important, a consultative process with certified expert simulation educators (n = 59) to determine how to best prepare students for simulation found that pre-briefing alone, may be insufficient to prepare for learning in this environment (McDermott, 2016). Key findings from the consultation were that the facilitator should plan for the simulation experience by considering the purpose of the experience, the learner characteristics (e.g., participants' previous experiences in simulation, knowledge level, and experience); their profession (doctor/nurse/ student); and also the practice setting. McDermott also recommended that educators engage participants in pre-simulation activities to provide the required knowledge and that scheduled time be assigned in the pre-briefing to discuss the simulation and answer any questions.

Findings from two studies about preparation for simulation (Chmil et al., 2015; Page-Cutrara and Turk, 2017) are consistent with McDermott's (2016) recommendations. Chmil et al. (2015) designed a simulation based on Kolb's (1984) experiential learning theory (abstract conceptualisation, active experimentation, concrete experience, and reflective observation) and examined the effect of this model on students' clinical judgement. Before the simulation, students in the experimental group were tested on concepts related to the scenario; they then applied these to the case, created a concept map and identified their expectations of the simulation. After the simulation, the students were asked to reflect on their expectations of the simulation, and compare this to the actual outcomes. Findings revealed that the clinical judgement scores of the students who engaged in the experiential treatment were significantly higher than those in the control group who did not have this additional preparation.

Page-Cutrara and Turk (2017) examined the effect of a structured pre-briefing on nursing students' competency performance in the simulation and clinical judgement, and also explored students' perceptions of the pre-briefing experience. The control group (n = 34) received the traditional pre-briefing, which mostly evolved orientation to the scenario and environment. The experimental group (n = 42) were similarly orientated, but they also worked through a clinical judgement worksheet which posed questions to help them consider the scenario, perceive the meaning and anticipate a plan of action. During pre-briefing, the principal investigator used prompts from the worksheet to facilitate reflection. Participants in the experimental group demonstrated a significant difference in competency performance and clinical judgement. These authors concluded a structured pre-briefing has the potential to positively impact nursing students' competency to perform in the simulation and also their clinical judgement.

A pre-briefing strategy that seems particularly beneficial for novice learners is the use of expert role-modelling. Coram (2016) conducted a quasi-experimental study and found that students who viewed a video of an expert role-model during pre-briefing, had statistically significant higher clinical judgement scores than those who did not observe the video. Likewise, a large multi-site (n = 5) mixed-method study involving undergraduate students (n = 275) revealed that watching an expert nurse role-model the expected care of the simulated patient before the simulation, offered several educational benefits for the students (Lasater et al., 2014). These included an ability to grasp the clinical situation, encouragement of critical thinking, increased confidence to care for the simulated patient, and an idea of what to expect in clinical practice. Although these results are positive, the findings also showed that, after four weeks, there was no difference in the clinical judgement scores of students who observed the video of the expert role-model, and those who did not. Lasater and colleagues concluded that watching an expert role-model before the simulation could positively impact students' development of clinical judgement for a period. This is an interesting finding because it raises a question about the retainment of knowledge after a simulation.

Other findings in this study from Lasater et al., (2014) were students expected to receive more psychosocial and health history in the simulation. The students also made frequent negative comments about being observed, which Lasater and colleagues suggested was due to their insecurity about skill level. In addition, the educators reported the students seemed unsure which patient information was vital in the simulation and that the students did not seem skilled enough to handle the complexities of added family or other healthcare team members.

While evidence such as this shows that preparation and briefing are beneficial, the effect of these strategies to decrease anxiety in the simulation are less clear. For example, Jensen (2013) conducted a study to evaluate nursing students' clinical reasoning in simulations. One of their findings was lecturers believed some students were underperforming because of anxiety. In response, the lecturers introduced an "open house" (p. 25) to familiarise the students to the simulation environment. However, this initiative did not appear to decrease the students' anxiety. According to the students, the presence of a lecturer in the simulation room was the main contributor to their stress. Jensen concluded that to improve overall simulation outcomes, strategies to reduce student anxiety before the simulation are required and that this area needs further research.

Similarly, Gantt (2013) conducted a quasi-experimental study to examine the impact of preparation on anxiety and performance. The findings revealed no significant difference in anxiety levels between the experimental group, who received an extra hour of supervised simulation experience, to those in the control group, who received standard preparation. Gantt suggested confounding variables, such as changes in teaching practice during the semester and small participant numbers (n = 24) may have diluted any effect. Interestingly, Gantt also found that providing students with access to staged videos of faculty role-modelling expected care was an excellent preparation strategy.

To summarise, the evidence from these studies indicates that preparation and pre-briefing are important strategies to develop students' clinical judgement in simulations. For novices, role-modelling the expected care seems to be particularly beneficial. This finding is supported by other research that found students value guidance from an expert and also opportunities to watch an experienced nurse provide nursing care (Erlam, Smythe, & Clair, 2016; Kelly, Hager, & Gallagher, 2014). However currently, the level of guidance, amount of preparation and expert role-modelling varies widely in nursing programmes (Kelly et. al., 2014; Lesa & Daniel, 2016). Nonetheless, overall findings indicate that both preparation and expert role-modelling may play an important role in the development of clinical judgement in nursing students.

Debriefing

Debriefing after the simulation is a core component of simulation design (Jeffries, 2016). For clinical judgement development, the debriefing session is particularly important (Lavoie et al., 2016; Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2013; Sabei & Lasater, 2016; Weaver,

2015). There are several research-based recommendations about best debriefing practices. These include scheduling the debriefing immediately after the simulation (Nickerson, Morrison, & Pollard, 2011), timetabling the session two to three times longer than the simulation scenario (Waxman, 2010) and ensuring debriefing is student-centred (Mariani et al., 2013). However, empirical data to support best practice in debriefing is lacking (Jeffries, 2016). For example, several authors recommend using a structured debriefing guide to promote clinical judgement (Lavoie et al., 2016; Sabei & Lasater, 2016; Weaver, 2015); yet a study that compared the clinical judgement skills of students who received structured debriefing to those who received an unstructured debriefing, found no significant difference in clinical judgement scores between groups (Mariani et al., 2013). Further, a study exploring the practices of expert debriefers concluded that although practical debriefing skills are essential, artistry (creative skill or ability, flexibility, balancing, and thinking on your feet) is equally important (Krogh, Bearman, & Nestel, 2016).

Despite these findings, there is a general acceptance that structured or reflective guides are important debriefing tools. For example, Sabei and Lasater (2016) published a structured reflective debriefing guide and suggested it may help students appraise their psychomotor, cognitive and affective performance. They also recommended the LCJR (Lasater, 2007a) as a tool to evaluate the student's performance while talking through the dimensions of Tanner's clinical judgement model (noticing, interpreting, responding and reflecting) during debriefing (Tanner, 2006). Mariani et al. (2013) suggested structured debriefing offers several benefits for the student. These include, learner-focused discussions, a focus on what was right rather than wrong, a holistic approach to the care of the patient, and the opportunity for students to connect theory and clinical learning.

Other recommendations to develop students' clinical judgement in the debriefing session include the use of facilitator-guided questions to help students identify their strengths, weaknesses, and areas for future improvement (Lavoie et al., 2016) and, meaningful reflection, so students can examine their performance (Sabei & Lasater, 2016). Strategies such as these are thought to help students apply classroom knowledge to clinical practice (Sabei & Lasater, 2016), and encourage students to connect what they noticed with pathophysiology, to reach a potential diagnosis (Lavoie et al., 2016).

Weaver (2015) published an innovative debriefing strategy which involved showing students a video of expected performance, after the simulation. The research revealed a significant difference in the clinical judgement scores of the students who watched the video compared to those who did not. In another study, Lavoie et al. (2016) found positive group dynamics (good communication, openness, and respect for each other) was a crucial aspect of debriefing. These researchers suggested small groups (up to six students) was the ideal number in a simulation. They also suggested student attributes, such as an ability to systematically appraise the simulated scenario; a preference for learner-based discussions; preparation; and personal expectations, were likely to impact on the debriefing experience.

These research findings show that the debriefing session is an essential component of a simulation to develop nursing students' clinical judgement. Debriefing offers students an opportunity to reflect on their performance and apply theoretical concepts to their actions for future learning. Unanswered questions include the impact of structured or unstructured debriefing guides, benefits of expert role modelling after the simulation, and, the effect of facilitator expertise on the students' development of clinical judgement.

The Lasater Clinical Judgement Rubric (LCJR)

Nurse educators struggle with the challenging concept of how to teach and evaluate clinical judgement because many dimensions involved in this process are unseen. For example, in her clinical judgement model, Tanner (2006) suggests that the nurse's expectations and personal background influence what they notice in a clinical situation and consequently, their clinical judgement. However, elements such as these are unobserved and thus problematic to measure. Further, while an analytic form of reasoning might be evaluated by an examination or test, intuitive and narrative reasoning processes are difficult to capture because these reasoning patterns are influenced by the context of the clinical situation (Benner et al., 2009b).

Lasater (2007a) developed the clinical judgement rubric to address the difficulties of evaluating students' clinical judgement in simulations. The initial purpose of the rubric was to provide simulation educators with a tool to guide feedback in the debriefing session and also assess students' clinical judgement. The rubric is based on Tanner's (2006) clinical judgement model and provides behavioural descriptors in 11 dimensions to score students' ability to notice, interpret and respond in a clinical scenario. The rubric grades students at either a beginning, developing, accomplished, or exemplary level. Table 6 provides an excerpt of the rubric.

Table 6 Excerpt from the Lasater clinical judgement rubric (LCJR)(Lasater, 2007a)

Dimension	**Exemplary**	**Accomplished**	**Developing**	**Beginning**
Effective noticing involves:				
Focused observation	Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information	Regularly observes and monitors a variety of data, including both subjective and objective; most useful information is noticed; may miss the most subtle signs	Attempts to monitor a variety of subjective and objective data but is overwhelmed by the array of data; focuses on the most obvious data, missing some important information	Confused by the clinical situation and the amount and kind of data; observation is not organized and important data are missed, and/or assessment errors are made
Recognising deviations from expected patterns	Recognises subtle patterns and deviations from expected patterns in data and uses these to guide the assessment	Recognises most obvious patterns and deviations in data and uses these to continually assess	Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment	Focuses on one thing at a time and misses most patterns and deviations from expectations; misses opportunities to refine the assessment
Effective responding involves:				
Calm, confident manner	Assumes responsibility; delegates team assignments; assesses patients and reassures them and their families	Generally displays leadership and confidence and is able to control or calm most situations; may show stress in particularly difficult or complex situations	Is tentative in the leader role; reassures patients and families in routine and relatively simple situations, but becomes stressed and disorganised easily	Except in simple and routine situations, is stressed and disorganised, lacks control, makes patients and families anxious or less able to cooperate
© 2005, Kathie Lasater, EdD, RN. Developed from Tanner's (2006) Clinical Judgement Model.				

Researchers have also used the LCJR as measuring tool for research purposes (Ashcraft et al., 2013; Dillard et al., 2009; Yuan et al., 2014). The psychometric validation and reliability of the LCJR are reported to have an inter-rater reliability of 0.89, an intra-rater reliability of 0.91, and, an internal consistency of 0.97 (Adamson & Prion, 2013). Other researchers have also validated the rubric (Shin, Park, & Shim, 2015; Victor-Chmil & Larew, 2013). Essentially, these metrics show there is high evaluator consistency if the same person repeats their rating of the performance at different times, and if different assessors score the students. While these metrics makes the tool attractive to use, reliability does not necessarily equate with validity (Adamson & Prion, 2013). For example, the LCJR may measure the constructs within the rubric, such as noticing and interpreting, yet because the patient context influences the nurse's clinical judgement (Tanner, 2006), the rubric might not accurately measure the student's ability to make a clinical judgement. It is also important to query the constructs because Lasater (2007a) based the rubric on Tanner's (2006) clinical judgement model, which describes qualitative dimensions that are mostly unseen and thus difficult to measure.

Fedko and Dreifuerst (2017) recently questioned the validity of the LCJR. These researchers conducted a pilot study to determine if students' clinical judgement scores in simulation correlated with the action taken. Their findings revealed that a student's ability to notice, interpret, and prioritise the data, did not necessarily result in completion of the indicated actions because, on average, the students only completed half of the required nursing actions. These researchers concluded the LCJR score did not show whether appropriate nursing actions were carried out and recommended adding a descriptor in the responding dimension, "completes indicated actions" (p. 49). Importantly, they advised educators to exercise caution when using the LCJR because scoring exemplary in one dimension does not indicate whether the student carried out the appropriate action. Table 7 provides an excerpt of the LCJR highlighting the added descriptor.

Table 7 Excerpt from LCJR (Lasater, 2007) Noticing, Interpreting and Response with highlighted added descriptor

Effective noticing involves:	
Focused observation	Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information
Recognizing deviations from expected patterns	Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment
Effective interpreting involves:	
Prioritizing data	Focuses on the most relevant and important data useful for explaining the patient's condition
Making sense of data	Even when facing complex, conflicting, or confusing data, is able to (a) note and make sense of patterns in the patient's data, (b) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (c) develop plans for interventions that can be justified in terms of their likelihood of success
Effective responding involves:	
Well-planned intervention/flexibility	Interventions are tailored for the individual patient; monitors patient progress closely and is able to adjust treatment as indicated by patient response New descriptor: Completes indicated actions

These findings show there are some limitations of using the LCJR to evaluate students' clinical judgement. These limitations are acknowledged by other researchers who recommend further studies to investigate construct validity and determine the applicability of the LCJR in different nursing populations, and, in non-simulation contexts (Adamson & Prion, 2013; Victor-Chmil & Larew, 2013).

Research using the Lasater Clinical Judgement Rubric (LCJR)

Despite the questions about construct validity and the influence of context, researchers have used the LCJR extensively in simulation studies seeking to evaluate students' clinical judgement. For example, Dillard et al. (2009) evaluated lecturers' and students' perceptions of the use of the LCJR to assess clinical judgement. At the time, lecturers were still learning how to teach in simulations, and the researchers identified that using the LCJR required a "specific pedagogical skill" (p. 5). This finding reflected the researchers' conclusions that lecturers need training in how to use the LCJR. Dillard and colleagues also suggested that simulations may contribute to clinical judgement development because students can actively engage in the learning process, which enables them to grasp the concepts of the scenario.

Bambini et al. (2009) used the LCJR in a quasi-experimental study to evaluate whether learning in simulations increased the self-efficacy of nursing students preparing to enter the obstetrics clinical setting. Results indicated that the students experienced a significant increase in overall self-efficacy (their perception of how well prepared they were for the task) and confidence to perform the assessment skills required to make a clinical judgement. The students said they learned the importance of prioritising assessment, when and how to intervene, and how to better identify abnormal physical assessment findings. However, the researchers also noted the students seemed to struggle to transfer the theory learned in the classroom to the simulation context. They noticed the students tended to rely on the specific rules of obstetric management rather than applying the rules in the context of the patient situation. This finding suggests educators need to help students contextualise their simulation learning to the different ways in which a patient may present.

Blum, Borglund, and Parcells (2010) used the LCJR to conduct a quasi-experimental, quantitative study of the relationship between simulation and students' self-confidence and clinical competence. The students rated their performance using the LCJR, and likewise, the faculty independently used the LCJR to rate the students. Results revealed that students' self-confidence and competence improved over the semester. A key finding was the competence and confidence in the group who used the traditional approach of task trainers, or student actors, were no different to the students who used a high-fidelity simulator. These authors suggested there was a need to reconsider the use of expensive simulation equipment to develop students' foundational skills and also proposed simulations might be more appropriate in later years when students are better equipped to integrate multiple contextual factors. Similarly, Ashcraft

et al. (2013) suggested a checklist rather than a rubric is more appropriate for a beginning student because, in the early years, the priority is the acquisition of fundamental nursing skills, which are typically rule-based. To learn these basic skills, students can practise with a checklist that shows the required steps. They suggested the LCJR is more suited for the third year when students are expected to think holistically and clinically reason. Based on the findings of these researchers, to design a simulation to develop clinical judgement, educators must take into account the development stage of the student and consider which resources are most appropriate.

Yuan et al. (2014) used the LCJR in a quasi-experimental study to assess second and third-year nursing students' clinical judgement in five different high-fidelity simulations. These included patients with, respectively, appendicitis, chronic obstructive pulmonary disease, gastrointestinal bleeding, myocardial infarction, and critical trauma. As might be expected, students' clinical judgement scores increased from the first to fifth simulation. The students reported that participating in these simulations increased their theoretical knowledge and helped them notice, interpret, and respond appropriately to clinical emergencies. The researchers concluded that using simulations had the potential to support the development of clinical judgement in nursing students.

A surprising finding in this study (Yuan et al. 2014) was that, compared to third-year nursing students, second-year students achieved significantly higher scores on the rubric in four of the five simulations. This is an interesting finding because one would expect the scores of the third-year students' would be higher, as they were further along in their studies. The researchers queried whether this finding could be explained by different levels of engagement because, according to the tutors, second-year students seemed more engaged in the simulation and in the discussions, appeared to value the newly-learned knowledge. By comparison, the third-year students were less likely to review their knowledge before the simulation and their understanding of the previous two years' content seemed shallow. There could be various explanations for this finding, for example, the quality of teaching each cohort received or differences within the groups. However, Yuan and colleagues suggested there could be a possible relationship between intrinsic motivation and learning in simulations, which needs further investigation.

In a more recent study, nursing students used the LCJR to rate their own clinical judgement in a simulation (Strickland et al., 2017). The researchers then compared the students' self-

assessment of their clinical judgement with that of the lecturer. A key finding was the students rated themselves higher on the rubric than the lecturers did. The researchers pointed out that this finding has implications for patient care because students may be overconfident in the clinical setting. They concluded nurse educators need to directly observe and evaluate students' clinical judgement and provide the necessary feedback required to become a competent nurse.

While the studies discussed in this section highlight the value of the LCJR (Lasater, 2007), they also raise questions. For example, why did second-year students score better than third-year students on the LCJR, and, what is the role of intrinsic motivation? Does the rubric account for the educational level of the student, and, is the LCJR better suited as an evaluation tool in the later years when students have more knowledge and experience? Further, the finding that students may overrate their performance in simulations is concerning as this may lead to overconfidence in the clinical setting, which may put patients at risk. Perhaps the most important finding is, first, the rubric does not account for the influence of context, and second, it does not show whether students carried out the correct intervention in response to what they noticed in the simulation. Therefore, when lecturers use the LCJR to evaluate students' clinical judgement, it might not be an accurate reflection of the students' clinical judgement ability.

CONCLUSION

Skills in clinical judgement are considered an essential nursing competency (Sommers, 2018). Traditionally, nursing students developed these skills in the clinical environment, however, in New Zealand, finding quality learning opportunities in the clinical setting is becoming problematic (Lesa & Daniel, 2016). Simulations are seen as a potential solution and are increasingly used to cultivate clinical judgement.

In New Zealand, NETS proposed investigating the possibility of substituting a proportion of clinical hours with simulations (National Nursing Organisation, 2014). In preparation for this potential, NETS sent a survey to leaders in nursing education and practice asking them to prioritise, in order of importance, the top 15 educational outcomes required from simulations. Clinical reasoning and clinical judgement were ranked as the two most important (Wordsworth et al., 2014). This finding is not surprising because clinical judgement is the foundation for all nursing practice, for continuous learning about this practice, and, for safe patient care. Further, the complexity and uncertainty of patient care mean student nurses must be prepared to deal with the unknown and be adept at reasoning to make the right clinical judgement for the patient.

Accordingly, graduating competent nurses skilled in clinical judgement is high on the agenda of nursing education (Nursing Council of New Zealand, 2016).

To effectively facilitate a simulation, educators require an understanding of simulation pedagogy and best-practice standards. They also need the knowledge and skills required to foster a psychologically-safe simulation environment. However, New Zealand literature suggests that currently, undergraduate nursing schools face specific challenges in regards to the upskilling of staff, resourcing a simulation programme, and integrating simulations into the nursing curriculum (Lesa & Daniel, 2016). The reality of substituting a proportion of clinical hours with simulations in New Zealand is therefore unlikely in the near future. On the other hand, when one considers the advancement of simulation science over the last decade, this reality could be quite close. Therefore, to prepare for this possible eventuality, educators and researchers must continue to be diligent in adding knowledge to the science of simulations.

Research shows simulations are a valuable educational tool. They are especially useful as a practice environment that has no patient risk. There is also increasing evidence that simulations are helpful for developing clinical judgement in nursing students. However, there is a notable emphasis on the use of the LCJR to evaluate this outcome. A reliance on this tool is not surprising because the rubric provides criteria for evaluating a student's performance quantitatively. However, other studies report students are often anxious in simulations, they may find cue recognition difficult and they may struggle with the contrived nature of the simulation. Factors such as these are likely to affect the student's performance during the simulation and therefore, a student's clinical judgement score in simulation may not accurately reflect their clinical judgement ability.

In summary, there is no doubt that simulations are useful for a wide range of learning opportunities and the use of simulations is valued across the sector. Nonetheless, until the development of clinical judgement in simulations and clinical practice are better understood, nursing educators who rely on simulations may struggle to graduate nurses who are both confident and competent in their clinical judgement skills. This thesis aims to provide new insights about simulations and its relationship to the clinical environment to develop clinical judgement by exploring the experiences of third-year nursing students who have participated in 15 simulations and spent at least 16 weeks in the clinical environment. In doing so, this thesis

will offer valuable data in regards to the design of educational interventions in both the simaution and clinical environment to cultivate clinical judgement skills in nursing students.

This study places an emphasis on the student's voice. The study aims to add to the ongoing dialogue about the potential use of simulation as an alternative learning environment to foster the development of clinical judgement in nursing students. To fulfil these aims, this thesis considers two research questions:

1) How do nursing students experience simulation as an environment for learning?

2) How do nursing students' learning experiences in simulations and clinical practice influence their development of clinical judgement skills?

The next chapter presents the research methodology used to answer the research questions and my ontology and epistemology. The chapter also includes a discussion about the ethical considerations for this study and how I sought to ensure credibility and trustworthiness in the research process.

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CHAPTER THREE: METHODOLOGY

INTRODUCTION

This chapter presents the research methodology. It begins with the research aims, research questions, ontology and epistemology. Next the chapter presents the research design, the study context and methods used to answer the research questions. An overview of how the data was analysed and ethical considerations follows. The chapter concludes with a discussion about how I sought to ensure credibility and trustworthiness in the research process.

PURPOSE OF THE RESEARCH

The overarching purpose of this research was to explore the learning experiences of third-year undergraduate nursing students in simulation. This study places an emphasis on the student's voice. The study aims to add to the ongoing dialogue about the potential use of simulation as an alternate learning environment to foster the development of clinical judgement in nursing students. To fulfil these aims, this thesis considers two research questions:

1. How do nursing students experience simulation as an environment for learning?
2. How do nursing students' learning experiences in simulations and clinical practice influence their development of clinical judgement skills?

ONTOLOGY AND EPISTEMOLOGY

My approach to understanding undergraduate nursing students' experiences in simulation is constructivism. Constructivism holds a philosophical view that individuals construct truth and meaning in response to their personal experiences and social interactions (Gray, 2013). Therefore, each person perceives reality differently and, as such, there are multiple perspectives and constructions, waiting to be discovered. Despite multiple realities, each person's worldview is valid and may change at any given time depending on their current reality (Guba & Lincoln, 1994). Holding this worldview, I believe each student's experiences in simulation will differ as will their perception of learning in this environment. The students' perspectives may also differ from those who design and facilitate simulation; therefore it is essential to hear and understand the student voice to facilitate student learning in this environment. Bringing the student voice into the planning, design, and facilitation of simulation can help educators use simulation more effectively to develop clinical judgement in nursing students. Capturing the

student's voice requires interactions with the participants; therefore a qualitative inquiry was an appropriate choice for this research.

An essential component of qualitative inquiry is reflexivity (Lincoln & Guba, 2002). Lincoln and Guba define reflectivity as reflecting critically on yourself as a researcher. I recognised early in the design process of this study that as a qualitative researcher, it was imperative to explore how my personal and social experiences influenced the theoretical perspective adopted for this research. Declaring my values and beliefs can facilitate better communication and trust in the research outcomes (Gray, 2013). Given this epistemological stance, my starting point must be one of acknowledging how my teaching and learning philosophy influences my worldview.

During my nursing education, one particular incident stands out. This incident occurred during my second year as a student when I was preparing an intravenous medication in front of a nursing tutor. I had difficulty drawing up the drug because I was nervous. I distinctly remember the tutor grabbing the vial, syringe, and needle from me, and in an annoyed voice saying, 'not like that, do it like this.' I tried to explain I was left-handed, and because she was showing me with a right-handed technique, it was taking me longer to grasp the skill. I vividly recall feeling intimidated and unable to perform the skill correctly in her presence.

This incident shaped my teaching and learning philosophy, which I still hold today. First, and perhaps the most important for me, is I believe that teaching students a clinical skill requires a supportive and positive demeanour because the lecturer's presence may induce anxiety and affect the student's ability to learn. Second, I hold that educators need to facilitate learning by using strategies that enable students to construct knowledge rather than being 'talked at' by the teacher. Third, I believe reflection on a learning experience can be transformative.

My motivation to establish a simulation programme was partially inspired by this teaching and learning philosophy. I envisaged the use of simulation as an experiential learning opportunity for students to practise clinical scenarios, reflect on their actions, and then receive supportive and positive feedback with application for nursing practice from an experienced lecturer. However, as mentioned in chapter one, I questioned whether the nursing students experienced simulation the way I envisaged. This question, and my personal belief that the educator must be supportive and positive in their approach, informed my reality in this research inquiry. I recognise and acknowledge that the interpretation of the data and the final product of this study

is filtered and shaped through these prior experiences and my understanding of the simulation literature.

RESEARCH DESIGN

This research employed an exploratory case study design to answer the research questions. By selecting a case study design, I could stay true to my ontological position that there are multiple realities experienced by the participants in this study. Yin (2017) suggests 'what' or 'how' questions fit with case study design because the researcher is seeking to explore or explain a phenomenon. Further, a case study can focus on a particular programme to provide insights into experiences that result in a "rich and holistic account" of the phenomenon (Merriam, 2009, p. 49). Researchers can also view participants' experiences through multiple lenses because the researcher can collect data in a variety of ways (Yin, 2017).

Case study research can use qualitative, quantitative or mixed method approaches (Stake, 1995). The overall aim of the research guides which approach is selected. My study aims to foreground the student's voice to improve future simulation practices. The purpose of highlighting students' experiences is to increase the awareness of what it is like to be a nursing student participating in a simulation. Accordingly, a qualitative case study was selected to explore students' experiences in simulation and compare this to their experiences in clinical practice.

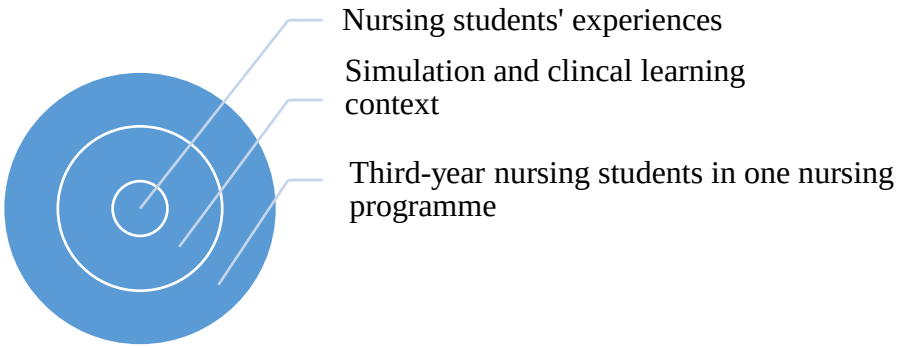
Merriam (1998) defines case study as "an intensive, holistic description and analysis of a bounded phenomenon such as a program, an institution, a person, a process, or a social unit" (p. 34). Yin (2009) defines this further, by describing a case as "a contemporary phenomenon within its real-life context, especially when the boundaries between a phenomenon and context are not clear and the researcher has little control over the phenomenon and context" (p. 13). Yin describes three approaches to case studies; descriptive, exploratory, or explanatory. My case study is both descriptive and exploratory because it seeks to explore and understand the phenomena of students' experiences within the contexts of simulation and clinical practice.

Yin (2017) also proposes cases may be a "single holistic design, single embedded design, multiple holistic design, or a multiple embedded design" (p. 46). During the design process of this research inquiry, I considered whether to select a single case at one nursing school or choose multiple cases at several nursing schools. The selection of a single case was due to variations in how simulations are implemented in New Zealand nursing schools (Lesa &

Daniel, 2016). Selecting a single case removed curriculum variables and enabled focus on students' experiences in the context of one simulation programme and one year level.

An important aspect of case study research is defining the boundaries of the case because it helps the researcher distinguish the phenomenon of the study from the context and identify what needs to be in the case (Yin, 2017). For my case study, the central research phenomenon is the experiences of third-year nursing students. Figure 4 shows that the central phenomenon, in this case, is nursing students' experiences; the middle layer is the learning context (simulation and clinical practice) in which students develop clinical judgement skills; and, the outer boundary of the case is the nursing programme accessed for this study.

Figure 4 ***Case Boundaries***



One criticism aimed at case study design relates to the notion that one cannot generalise from a single case so it "cannot contribute to scientific development" (Flyvbjerg, 2006, p. 1). However, a qualitative inquiry does not seek to generalise, and as Flyvbjerg points out, readers may underestimate the strength of a single case. Other criticisms of a qualitative case study are similar to that of most qualitative inquiries in that because the researcher collects and interprets the data, there is the potential to confirm prior notions which may compromise the integrity of the findings (Stake, 1995; Flyvbjerg, 2006). However, this potential exists in all forms of research inquiries which is why reflexivity, and explaining how I addressed credibility and trustworthiness throughout the research process, are essential (discussed in the final section of the chapter).

Flyvbierg (2006) also suggests there is a common misunderstanding that case studies are more useful in the beginning stages of the research process to generate a hypothesis, and less useful for building theory. However, Flyvbierg counters this notion by explaining a case study provides an in-depth investigation and context-specific knowledge, which is useful to the

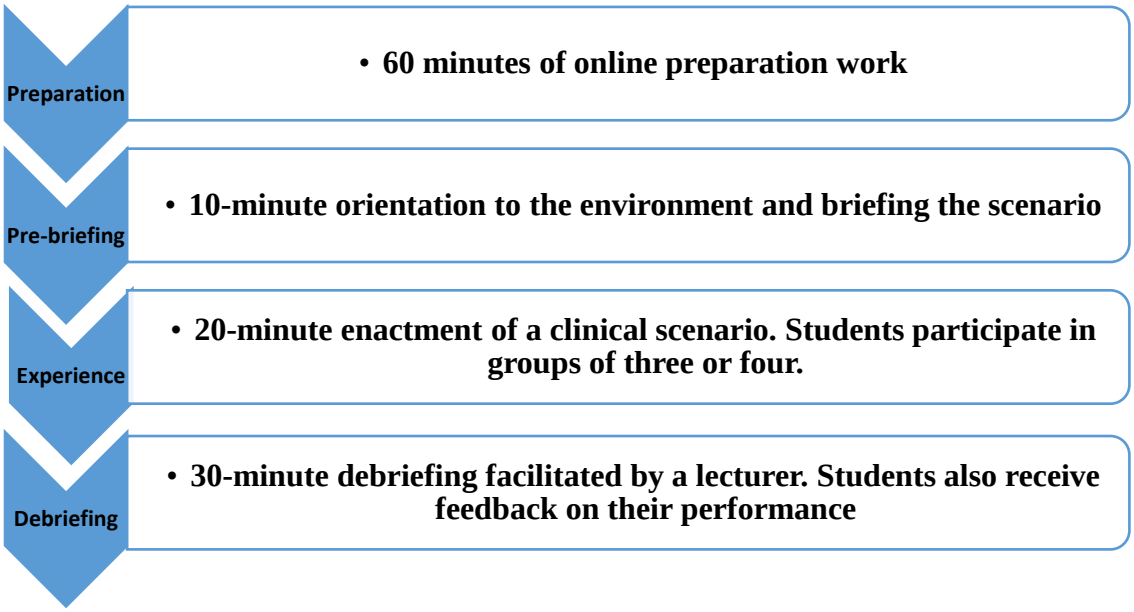
human sciences. Employing a case study for my research enabled exploration of one simulation programme in-depth to offer a holistic and contextual account of nursing students' experiences, which can generate new concepts to add to the body of knowledge in the simulation field.

A third criticism about case studies is they usually require an extended amount of time and produce large amounts of data to manage and analyse (Yin, 2009). However, as Yin contends, not all case studies depend solely on ethnographic or observational data; researchers can also produce a quality case study with less time-consuming methods such as collecting data via the telephone or the internet. My case study was a doctoral project which afforded the time, so this was not an issue.

THE CASE

As described in chapter one, the case for this study was an undergraduate nursing school of approximately 400 students. As stipulated by the NCNZ, students undertake 1100 hours of clinical practice during the three-year degree (Nursing Council of New Zealand, 2015). The students participated in 15 simulations during the degree. The simulations were designed to complement clinical courses and were aligned to one of four clinical disciplines (primary health, mental health, medical or surgical). Each simulation experience included four components. The first, preparation, consisted of 60 minutes of online work, which the students completed in their own time. The other three components included a 10-minute pre-briefing, participation in a 20-minute clinical scenario and a 30-minute debriefing. A nursing school lecturer facilitated the simulation which involved briefing the students, assisting during the scenario if required, and, leading the debriefing session which also included feedback on the students' performance. Figure 5 provides an overview of the simulation experience.

Figure 5 *Overview of the simulation experiences*



To enact the clinical scenario, each participant was assigned a role; nursing student, registered nurse, relative or peer observer. The peer observer watched from the control room and was encouraged to take notes and contribute to the debriefing session. The simulations occurred in one of two dedicated simulation rooms. One room was designed as an outpatient clinic. The other room resembled a hospital room (patient ward) and housed a high-fidelity simulator on a hospital bed. In between these two rooms was the control room with a one-way window into each room (Figure 6). The two simulation rooms were not used at the same time.

Figure 6 *One-way window and hospital simulation room*

** Photographs used with permission*

During the simulation, the facilitator, technician, and the student allocated an observation role were stationed in the control room and watched behind the one-way glass window. This meant those in the control room could see the students, whereas the students in the simulation room could not see those behind the window. Occasionally, additional people also observed, for example, an extra lecturer, another student, a visitor to the school or a lecturer being orientated to simulations. However, the space in the control room did not permit too many more observers. The simulations were not video-streamed in any capacity.

In the medical and surgical simulations, either a medium or high-fidelity simulator (a computerized full-body manikin programmed to provide realistic physiological responses to the student's actions) was used to portray the patient. Using a simulator enabled the depiction of the changing physiological parameters typical in medical and surgical scenarios. For these simulations, the technician provided the patient voice from the control room via a headpiece and microphone. In the primary and mental health simulations, an actor played the patient because an actor could portray behaviours usually seen in these types of clinical presentations.

METHODS

Third-year nursing students were the key informants in this research. By selecting students who had experience in simulation and clinical practice, I could uphold my constructivist view that individuals construct meaning and truth in response to their experiences and social interactions. To capture the student experience, I observed students in simulation, conducted interviews, collected clinical stories and reviewed documents pertinent to the simulations.

Sampling Method

A purposeful sampling method was chosen for this study. The reason for this sampling method was the research design necessitated participants who had experiences of learning in simulation and clinical practice. The nursing school chosen for this study had established a simulation programme three years before the commencement of this research. Therefore, the lecturers and students were familiar with teaching and learning in simulation. Further, the nursing students participated in 15 simulations during their degree which meant third-year nursing students had enough experience to draw on in the interviews. The nursing school was also convenient for access because of my association with the institution.

Procedures for Recruitment

To access the nursing school a letter was sent to the Head of School (Appendix A). The letter included information about the proposed research project and an invitation to meet with her to discuss the research. During this meeting, the Head of School gave permission to undertake the study with third-year nursing students the following year. When the study commenced, 106 nursing students were enrolled in the third year of the degree. To bind the case by time, students whose timetable consisted of simulations followed by a clinical placement in medical /surgical and then mental health were chosen as potential participants. The third-year coordinator timetabled a 15-minute meeting with all third-year nursing students (*n* =106). During this session, the research goal and process was explained, and the time commitment involved if students chose to participate. At the end of the session, potential participants (*n* =25) were invited to ask questions and collect the study information and consent form. Students were assured participation was voluntary, and if they would like to be involved, they should return the consent form within one week to the nursing reception. 12 students agreed to participate in the study. Table 8 outlines the participant demographics.

Table 8 Participant demographics (Pseudonyms)

	Age (years)	**Prior Healthcare experience**
Jill	20	No
Mary	20	No
Rose	21	Caregiving for a tetraplegic patient (2 years)
Ginny	21	No
Heather	22	No
Andy	23	Nurse aid in ED (3years) St John's Medic
Bailey	24	Rest home caregiver (5 months)
Ashley	25	Rest home caregiver (2 years)
Brooke	26	Life guard for St John (3 years)
Keegan	29	Home caregiver for person with disability (3 years)
Paris	32	No
Riley	35	Aged 21 withdrew from nursing degree end of 2nd year. Re-enrolled 12 years later

Additional data not illustrated in the table above is 11 of the participants were New Zealand European and one participant was Samoan/European. Only one of the 12 participants was male. Eight participants were working part-time to fund their study and three were parenting children.

DATA COLLECTION

Data collection occurred between March and June 2015. However, because this study was a doctoral project, the research was not completed until November 2018. Data collected included observations and video-recordings of simulations, two interviews, clinical stories and review of documents pertinent to the case. Throughout data collection, I recorded in a journal my thoughts and impressions from the observations and interviews. Table 9 explains the rationale for data collection.

Table 9 Rationale for data collection choices

Data Collection	**Purpose**
Observations	Observe both verbal and non-verbal characteristics of the simulation context and observe aspects not seen from the participant's perspectives Prompt the questions for the first interview Situate the interview data and interpret the meaning of the student's perspectives during analysis
Video stimulated recall	Stimulate participant recall and reflection on the simulation during the first interview
First Interview	Elicit the students' perspectives as to how they experienced learning in simulations Explore my impressions from the observations of the simulations
Clinical Stories	Explore the clinical-learning context through the lens of students' stories
Second Interview	Explore and discuss the clinical stories with the students Elicit the students' perspectives as to how learning in simulations compared to learning in the clinical environment
Document Review	Review the design templates of the simulations to provide background context to the research inquiry

Observations

The first phase of data collection involved direct observation of simulations to describe, understand and capture the context of the simulation environment. Observing simulations offered a holistic view of students' experiences in context and added depth to the interviews, which were based on students' perceptions.

Consent to observe the simulation was sought from all involved including students not in the study (they participated in groups of three or four), actors and staff. Two study participants were assigned to a group with a student who did not consent to observation. These participants attended the two interviews and provided clinical stories but their simulations were not observed. A total of 19 simulations (ten medical/surgical and nine mental health) were observed. Observation of each 60-minute simulation commenced when the participants arrived at the simulation room and concluded after the debriefing session. Due to timetabling, four groups were not observed in the debriefing session because when one group was debriefing, the next simulation started. In these situations, the debriefing session was audio-recorded.

To avoid disrupting or influencing the simulation, care was taken to observe unobtrusively behind the one-way mirror in the control room. The students were told during the simulation briefing that the purpose of my observation was to understand the simulation context and that I was not there in a facilitator role. Observations of the physical environment included the students' emotions, and their verbal and nonverbal behaviours. My observations were noted in a journal along with prompts about questions to explore during the subsequent interview.

Patton (2002) describes several advantages of observation. Observation enables the researcher to personally feel and absorb elements of the context such as language, nuances, and the intensity of the experience. It also assists with an inductive, discovery process because there is less need to rely on prior conceptualisations of the setting. By observing, it was possible to view and appreciate critical factors in the simulation environment, such as facilitation, debriefing, and how the students behaved in this environment, rather than relying on my preconceptions. Further, experiencing the simulation with the participants meant my impressions could add to the interpretation and data analysis. Another advantage of observation is it provides a check on the interview data because the researcher may observe things that participants are unaware of, or are reluctant to say (Patton, 2002).

Video Simulated Recall (VSR)

The purpose of video recording and playback was to stimulate the participants' recall of their experience in the simulation and discuss their actions. Simulated video recall may be useful because it can help the researcher understand what is important to discuss from the participant's perspective (Dempsey, 2010). Permission was sought from all group members (even if they were not in the research) to observe or video-record the simulation. Some group members gave permission for the simulation to be observed but not video-recorded. A potential explanation for this reluctance is some students may feel uncomfortable watching themselves on a screen. Consequently, only three participants' simulations were video-recorded. These three participants viewed the video-recording in the first interview after a shortened version of the interview questions (Appendix B). During the recall, they were asked to pause the video when they wanted to discuss their actions, feelings or thoughts. Occasionally, I stopped the video to explore and ask the participant about their thoughts and actions.

Interviews

Semi-structured interviews were conducted with 12 third-year nursing students. The first interview occurred after the students completed their six timetabled simulations. The second interview was after the completion of two clinical placements. Two students did not attend the second interview due to study commitments. Observation notes served as prompts for the first interview and the students' clinical stories guided questions in the second interview. Each interview lasted between 45 and 60 minutes.

The questions for both interviews were conversational, semi-structured and open-ended. The questions in the first interview asked the students to describe their learning experience in simulations and questioned their thoughts and feelings at various stages of the simulation. Students were also asked if they thought their experiences in simulation influenced their clinical practice (Appendix C). The second interview focused on the students clinical stories which provided an opportunity to explore their clinical experiences. Students were also asked about similarities and differences in their simulation and clinical experiences (Appendix D). During the interviews, notes were taken to serve as a reminder of what required further exploration.

Gray (2013) warns an interviewer may unconsciously bias the interview in subtle ways. Accordingly, I was mindful and cautious of the potential to influence the student's interview by the use of leading questions. At the conclusion of the interview, the guide was checked to

see if the planned questions were covered and whether my impressions from the other data sources were clarified. Immediately after the interview, notes were made about the interaction. These notes were reviewed during analysis when interpreting the interview data.

Clinical Stories

The purpose of collecting clinical stories was to explore how the students' experiences in simulation compared to their clinical experiences. The particular focus was on clinical judgement development. At the conclusion of interview one, the students were given a reflective template to document their stories. This reflective guide asked the students to describe the clinical situation, talk about their response and reflect on the learning experience (Appendix E). This guide was provided as an optional extra to help the students' document their stories. They were also given an option to send stories from their clinical portfolio. Only one student chose to use the guide. A possible reason students did not use the guide was because their clinical placements are usually very busy and sending stories they had already written for their portfolios was less time-consuming.

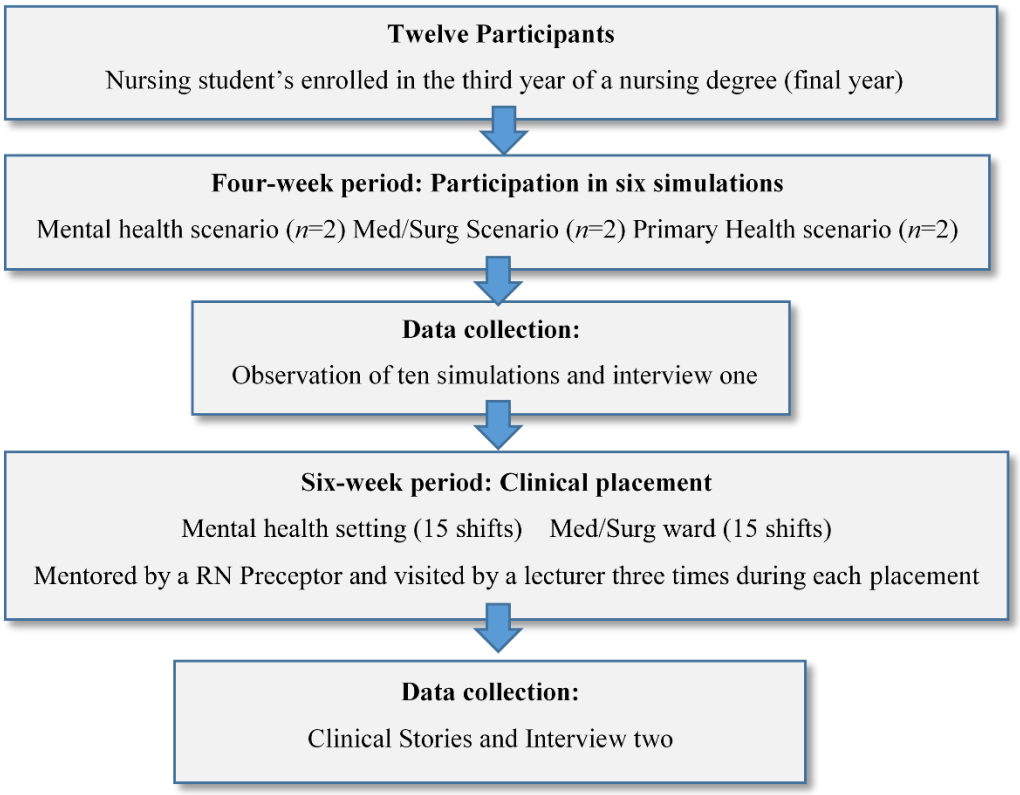
The students were also reassured that because their clinical placements were often busy, a minimum or a maximum number of stories was not required. However, they were encouraged to aim for one story for each placement. A total of 27 stories from 9 students were received. One student described stories of her clinical experiences during the interview in preference to writing about them. Two students did not send stories or attend the second interview. The clinical stories were reviewed and discussed in the second interview.

Document Review

The documents reviewed for this case study included the simulation template for each scenario and the confidentiality forms. The nursing school's simulation design template included objectives, the scenario outline, roles, and information about setting up and facilitating the simulation (Appendix F). I was given access to these documents for this research. Four scenario templates were relevant to this study because they described the simulation design for the simulations I observed. During data analysis, the students' descriptions of their experiences in simulation were triangulated with the information on the scenario template which added context to the interview data.

Figure 7 provides an overview of the timing of data collection in relation to the participants' timetabled simulation and clinical experiences.

Figure 7 Timing of data collection



TRIANGULATION OF DATA

A strength of case study research is the ability to triangulate data sources to confirm findings (Yin, 2017). Table 10 provides an example of how the data obtained from interviews, the simulation design template and observations were triangulated. The first example in this table shows that one of the learning objectives on the scenario template for a narcotic overdose was to recognise the significance of a reduced level of consciousness (LOC). However, Keegan's experiences in clinical practice suggest she did not meet this objective. The second example shows that the interview data supported my observation that Jill was quite giggly in the simulation.

Table 10 Triangulation of Data

Interview data	**Simulation design template**	**Observations**	**Comment**
"There were quite obvious differences, like she [patient in clinical] was still alert and conscious. It was just a matter of letting the senior nurse know and ask what she thought we should do … It wasn't a full on, call a crash team or anything like that" (Keegan)	Objectives: 1. Recognises signs and symptoms of respiratory depression 2. Recognises significance of reduced level of consciousness (LOC)		In clinical practice, Keegan did not seem to recognise the signs and symptoms of respiratory depression despite having participated in this simulation a few weeks earlier
"I think some people might not have that characteristic [to enjoy role play] and feel stupid talking to a manikin … But I do because I've always been a dramatic kind of person. I like to make people laugh" (Jill)		Students seem slow to respond, do not appear concerned about the patient and seem quite giggly. A lecturer said she worried about the blasé attitude of the students and wondered if this was a 'third year thing'.	Jill enjoys role play. Does this mean she is still taking it seriously and learning from it? Does laughter mean students are not learning?

DATA ANALYSIS

Several researchers provide recommendations on how to analyse case study data (e.g., Merriam, 1998; Stake, 1995; Yin, 2017). After considering the various options, a general inductive approach (Thomas, 2006) was selected to analyse the data. This approach aligns with a qualitative inquiry seeking to present descriptive themes. The aim of a general inductive approach is to categorise and derive key themes from the raw data. The research questions are kept at the forefront of the analysis and the researcher decides which data is important and relevant to answer these questions. The process of deriving themes commences with labelling categories from the data, describing what these categories mean and then illustrating the meaning of the category by assigning text. The categories are then linked according to commonalities and themes are developed. These themes can be incorporated into a model, theory or framework.

The aim of the analysis for this case study was to categorise and derive key themes from the observation notes, interview data and clinical stories. To organise the large amount of data this case study generated, individual and shared folders were created on a password-protected computer. After the initial filing of the data, copies of the interview transcripts, clinical stories, and journal notes were uploaded and filed in NVivo, the qualitative data management software used for this study. This program assisted with the retrieval of data, working with the text, coding and viewing the emerging themes. The analysis and interpretation of the data transpired in several phases, which is illustrated in Figure 8 below.

As Figure 8 illustrates, phase one of the data analysis commenced with reflection after each observation and interview. The purpose of this reflection was to consider possible meanings of what I had just observed or heard in the interview, and what this meant for student learning and the development of clinical development. My reflective thoughts were captured in a journal to enable recall for future data analysis. Phase two involved reading and summarising the transcripts and clinical stories to gather an overview of the participants' experiences. The coding and categorisation of data occurred in phase three and four. The first level of data coding was broad and as a result, 42 codes were generated. These initial codes were developed from my reading of the simulation literature and the meaning I personally ascribed to the text. Examples of these initial codes included tick-box, feelings of responsibility, pre-empting and group-work. Each initial code was exported from Nvivo into a Word document and reviewed with other codes for commonality in meaning, significant or frequent themes, and contradictory

points of view. During this process, the transcripts were revisited to check the context surrounding the participant's comment, or the meaning I ascribed to the text.

Figure 8 Phases of Analysis and Interpretation of the data

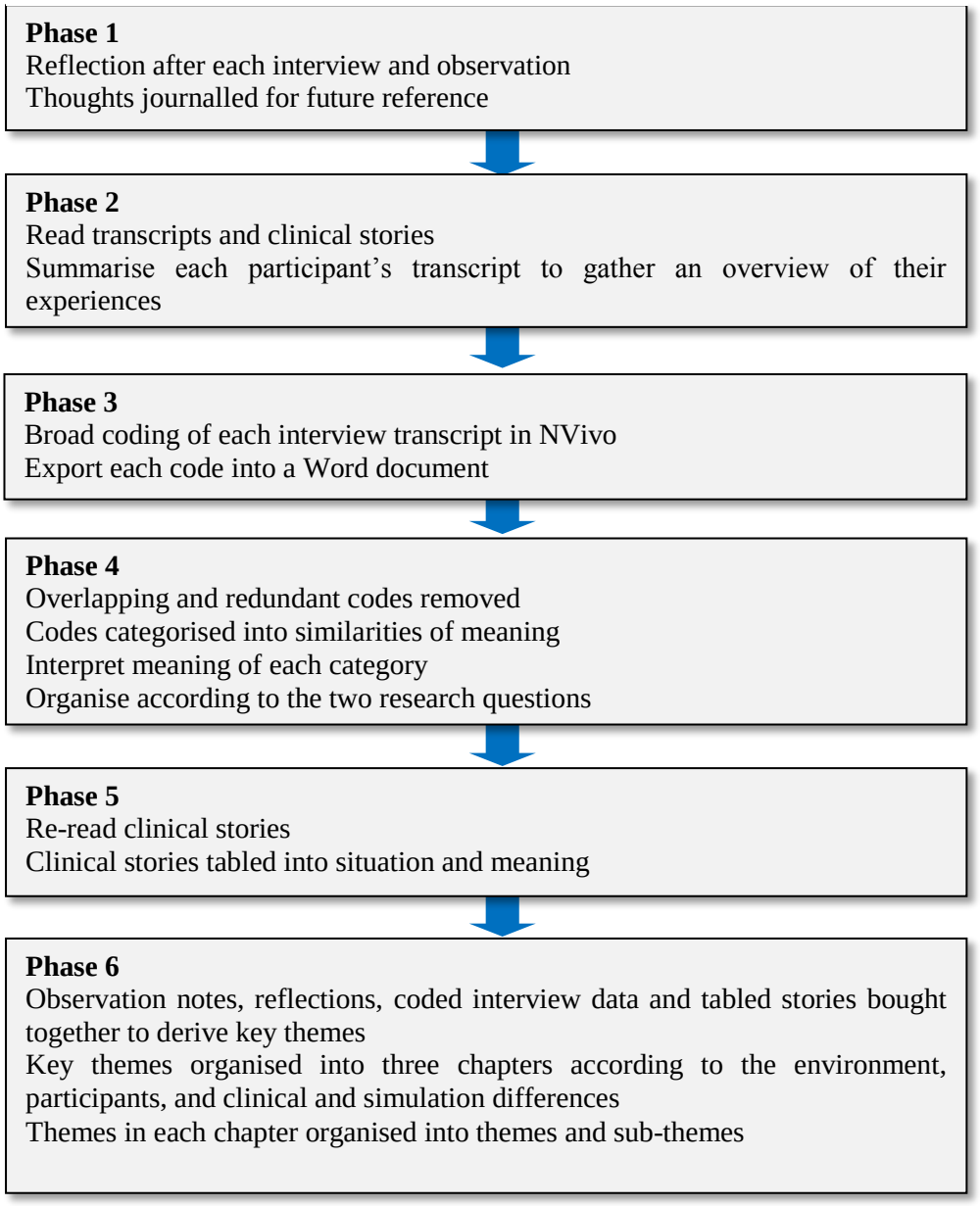


Table 11 below provides an example of coding and categorisation. The first column shows a participant comment, the second column the initial code assigned to the excerpt, and in the third column, the second level of coding, which was the beginning of categorisation. For example, Ashley's comment that 'it did not really matter' differed from the feelings of responsibility she experienced in clinical practice. These two codes were categorised as difference in clinical and simulation.

Table 11 Example of coding and categorizing

Excerpt	First level of Coding	Second level of coding
You have to try and really just look at the scenario rather than going, oh, you've got dot, dot, dot, and not getting too far ahead of yourself	Tick box	Effect of the simulation environment
So, I don't actually care if I stuffed it up or not	It doesn't really matter	Difference in clinical and simulation
This scenario made me really realise the huge importance of maintaining an effective airway, and how much responsibility the nurse has over the post-operative patient's life	Feeling of responsibility	Difference in clinical and simulation
I kind of, I go in there thinking I know what I've got to do and then something happens and I just go blank	Goes blank	Effect of the simulation environment
That was quite nerve-wracking, doing that on the spot	Put on the spot	Effect of the simulation environment
I find that once I'm in, I tend to be looking for the cues and like the side effects that I've read about and then that kind of leads the way because I always have a slight plan in my head	Pre-empting	Participant attribute

Table 12 provides an example of theme development. Column one provides an excerpt, column two shows my interpretation of the data, and column three shows the assigned theme or sub-theme.

Table 12 Example of theme development

Quote	**Key point**	**Themes / Subtheme**
We looked at the little hints in the scenario, we looked at the readings and said okay, this is what's going to happen … we discussed how we thought it was going to pan out 'what will we do if this happened?'		Preparation
*It just seems like **it's quite an unreal sort of situation** and I don't feel like I behave like I would in a real-life situation so it's really hard to judge what I would be doing normally*	Experiences in practice decreased the authenticity for her and influenced her behaviour	Perceptions of realism
***I don't like role play, not something I've ever enjoyed** or been good at it's just not something I've ever been good at*	Her past experiences tell her she is not good at it	Ability to role play
*It doesn't necessarily feel real but **I find it's important to treat it as real to get the most out of it***	Accepts it is not real but willing to see it as learning	Perceptions of Realism – Willingness
It makes everything harder and especially with nursing, I think it's a good thing to be doing and a lot of pressure on you, lot of pressure to do well	Why is this different for clinical? It is because they are necessarily trying to perform in clinical?	Prior Experiences - Personal stressors

The fifth phase of data analysis shown in Figure 8 above, involved reading participants' clinical stories and compiling notes about the situation, who it occurred with, the feelings participants described and the importance of the story for the participant. The stories were then tabled into one document according to the situation and the meaning I ascribed to the story. Table 13, provides an example of the meaning I ascribed to the clinical story and the theme developed from the story.

Table 13 Example of clinical story review

	Situation	**So what?**	**Theme**
G	A story about her reaction to seeing an abused baby	Reflected on her reactions to a distressing event. Talked about cruel people. She also experienced a feeling of reward after showing kindness.	Emotional connections
G	Heard a traumatic patient story	Evoked very "STRONG FEELINGS" Immense sadness She reflected on her personal reactions and the importance of not taking on a patient's feelings and emotions	Messy realities
B	Treated rudely by a team member	Felt embarrassed, stupid and worthless Reflected on safety in healthcare **My question:** You may not want to simulate feelings such as these but you could simulate conflict. However, will this change the behaviour?	Messy realities Inter-professional team
F	A patient returning to the ward dropped her respiratory rate and she [the student] didn't recognise this	Had to transfer theoretical knowledge to the reality and didn't recognise similarities. **My thoughts:** What was the learning objective of the simulation? (Must check scenario design	The critical incident

		template.) Is this about over-representing a worse-case scenario?	
K	Followed a patient from admission to discharge	Establishing therapeutic relationships. Clinical practice provided her with background information which helped her assess her patient	The 'whole' picture'

In the sixth phase of data analysis (Figure 8) all of the data were bought together to derive key themes. The final themes were the result of a continual refining process by looking for similarities in meanings and possible hierarchies. The research questions were at the forefront of the analysis to help determine what data were more, or less, important. The result was the creation of 11 themes and 9 subthemes, which summarised the key findings in relation to the research questions. The final themes and sub-themes were organised into three chapters:

- Participant-related factors
- Students experiences of facilitation
- Students experiences in the simulation and clinical environment

ETHICAL CONSIDERATIONS

Several ethical issues were considered during the planning of this research. First, during the recruitment of nursing students there was the potential for coercion because I taught in the nursing school. With this possibility in mind, potential students were reminded participation in the research was voluntary and there would be no consequence if they chose not to participate. The potential students were also given comprehensive information about the study and the time commitment involved (Appendix G). To offer these students enough time to consider whether to participate in the research, they were asked to return the consent form to the nursing reception within a week (Appendix H). I also considered the capacity of the students to participate as they were in the final year of their degree, which involves a significant amount of study alongside demanding clinical placements. Therefore, when I explained the study, I reminded students that if they needed to, they could withdraw from the study until data analysis commenced. Also considered was the effect of my teaching role on the participant's behaviour in simulation and their response in the interviews. However, at the time of data collection, I

had transitioned from teaching, to full-time study, and therefore did not have teaching or assessment responsibilities with this cohort of students.

Another ethical consideration was related to the consent process because the nursing students participated in their simulations in groups of three or four. Consequently, some research participants were in simulations with students who were not involved in this study. Therefore, written permission to observe was sought from all those involved in the simulations, which included actors and staff. If a nursing student did not want to be observed and they were in a group with a study participant, the simulation was not observed or video-recorded. Four of the study participants were in groups where the students consented to observation but not video-recording.

The issue of anonymity arose during data analysis because in the initial ethics proposal, I said the nursing school would not be named. However, as the study proceeded, it was evident background context was required to situate the case and enhance the credibility of the research design. Consequently, anonymity of the nursing school could not be assured. I also had insider knowledge about the nursing school's curriculum and simulation programme. The Head of School was contacted to discuss this insider information and talk about the potential that readers of this research may identify the nursing school. The Head of School agreed there was a possibility that the nursing school could be identified and granted permission to continue. The ethics for the research was updated and approved.

A final ethical consideration was confidentiality. To protect the privacy of the participants, pseudonyms are used and the transcriber was asked to sign a confidentiality agreement and delete the audios and transcripts at the conclusion of the work. The audio and video files were stored on a password-protected computer and erased from the recording device after the files had been converted. A locked drawer and computer passwords protected the other research data.

Ethics approval for this research was attained from the university where I was enrolled for this doctoral degree (D14/392), and the nursing school accessed for this study (ref. 600).

CRITERIA FOR TRUSTWORTHINESS AND CREDIBILTY

To establish trustworthiness and credibility in the research findings, I applied the TACT framework proposed by Daniel and Harland (2017). Four qualitative dimensions of trustworthiness, auditability, credibility and dependability underpin the TACT framework.

Trustworthiness

Trustworthiness requires the researcher to show that the research is positioned within the view of the participants in the study and, demonstrate researcher reflexivity (Daniel & Harland, 2017). According to Daniel and Harland, reflexivity requires the researcher to describe their experiences and assumptions related to the research phenomenon. To practise reflexivity, in chapter one, I described the circumstances that led to this research inquiry. In chapter three, my teaching and learning philosophy was highlighted. I also acknowledged that my experiences as a student nurse and educator informed my reality and shaped this research inquiry. To manage my assumptions about teaching and learning, with integrity, I captured my thoughts in a journal throughout the research journey. The purpose of this journal process was to bring to consciousness what I believed. This reflective process helped me to be mindful of my beliefs and approach data analysis openly. To remain open, I deliberated on the differences and similarities in the data in the light of multiple perspectives. I also explored alternative explanations of the data during analysis and in the presentation of the findings.

Merriam (1998) suggests that to enhance trustworthiness, the researcher should present the findings with enough detail so that the conclusions make sense. Nvivo software was instrumental in this process because I could view developing themes and locate similar perspectives in the data with relative ease. This process helped confirm if the developing explanations and patterns were significant. Another way I sought to demonstrate trustworthiness was to use appropriate quotations from the participants' transcripts and clinical stories to illustrate their perspectives.

Auditability

Auditability is the process of documenting the research process in enough detail to help the reader understand the conclusions from the research and how these conclusions align with the research design (Daniel & Harland, 2017). To establish auditability, the methodology chapter

(chapter three) describes each step of the research process. The interview transcripts, my observation and journal notes, and the audio and video recordings are retrievable if required.

Credibility

Credibility requires the researcher to show the findings are "credible, relevant and congruent" (Daniel & Harland, 2017, p. 116). One way to establish credibility is through triangulation of data sources. Case study design offers researchers the opportunity to collect data from multiple sources and triangulate this data during analysis (Yin, 2017). Data collected for this study included observations, simulated-video recall, two interviews, clinical stories, and document review. Triangulating this data meant I could interpret the findings from multiple perspectives thus enhance credibility. The data sources were triangulated during interpretation, analysis, and reporting of the data.

Another way credibility was addressed was the participants were interviewed twice, which permitted member validation (Guba & Lincoln, 1994). The first interview was after my observations of the simulations and the second, after two clinical placements. This process meant I could check my thoughts and interpretations about the observations, first interview and clinical stories with the participants. For example, in the first interview, I discussed my observation notes with the participants. In the second interview, the participants were given a copy of their transcript from their first interview and asked if there was anything they wanted to add or, if any of their original thoughts had changed. At the conclusion of the second interview, participants were invited to read their summarised transcript and contact me if they wished to clarify anything, or if the way their opinions were portrayed caused concern. No participants made contact about their summarised transcripts.

Transferability

In case study design, Merriam (1998) contends that the users of the research should decide if the research applies to their situation. The researcher should therefore provide enough detail in the presentation of the study to help the readers decide this fit (Lincoln & Guba, 1985). This research is not intended to be statistically generalised. However, detailed descriptions of the nursing school's simulation programme and participant demographics are included to assist readers determine if the principles underlying the themes may be transferred to their setting.

CONCLUSION

My methodological approach to understand nursing students' experiences in simulation was underpinned by a worldview that each student's experiences will differ as will their perception of learning in this environment. It is therefore essential to foreground the student voice because their experiences in simulation may differ from the viewpoint of those who design and facilitate simulation. Bringing the student voice into the planning, design, and facilitation of simulation may help educators use simulation effectively to develop clinical judgement in nursing students.

Consequently, a qualitative case study design was chosen as a way of exploring nursing students' experiences. Data collected included observations, interviews, clinical stories, and document review. Collecting multiple sources of data enhanced the credibility of this study because the students' experiences could be viewed through a variety of lenses and the data triangulated to provide a holistic and contextual account of their experiences in the simulation and clinical environment. Selecting a single case removed variables such as a different nursing programme or curriculum and enabled focus on the students' experiences in the context of one simulation programme and one year level.

The case for this research was described in detail to provide context for the research findings. The case description included information about the simulation programme and environment, components of the simulation experience and facilitation of the simulation. Participant demographics were also presented. Finally, ethical considerations and how I sought to establish trustworthiness and credibility were discussed.

In closing, it is important to acknowledge that I bring to this case study a significant amount of educational experience in both simulation and clinical practice. My insider position is both a strength and, if not addressed, a potential limitation of this study (Patton, 2002). It is a strength because my experience provided context to the interpretation of the data; it is a limitation in that my insider experience may cast doubt on the credibility of the research findings if not acknowledged (Merriam, 1998). This chapter sought to explain how this potential limitation was addressed by critically reflecting on myself as the researcher. I also acknowledge that the final product of this study is shaped by prior experiences and my understanding of the simulation literature.

The next three chapters present and discuss the research findings in relation to my two research questions:

1. How do nursing students experience simulation as an environment for learning?
2. How do nursing students' learning experiences in simulations and clinical practice influence their development of clinical judgement skills?

The focus for the next chapter is the influence of participant-related factors on the students' learning experience in simulation.

CHAPTER FOUR: PARTICIPANT-RELATED FACTORS

INTRODUCTION

This chapter is the first of three to present and discuss the research findings. This chapter highlights the influence of participant-related factors on the students' learning experiences in simulation. Drawing on data obtained from my observation of ten simulations and student interviews, four themes were identified:

1. Perception of realism
2. Comfort with role play
3. Preparation for the simulation
4. Collegiality and trust in the simulation group

The commonality in these four themes is they relate to what the participant brings to the simulation and how these factors influence the learning experience. The first theme, perception of realism, refers to the student's perception as to whether the simulation was an authentic replication of a clinical scenario. This perception could influence whether the student leveraged the learning opportunities in simulation. The second theme, comfort with role play, closely relates to perception of realism because to enact the simulated scenario, students were required to pretend and take on a role. For some students, this aspect could be challenging. The third theme, preparation for the simulation, describes the influence of the students' preparation on their assessment of the patient and responses in the simulation. The fourth theme, collegiality and trust in the simulation group, refers to the effect of group culture on students' learning experiences in simulation.

PERCEPTION OF REALISM

All 12 participants talked about their experiences of realism in the simulation. A shared feeling among participants was that a simulation could not authentically replicate a clinical scenario because the simulated patient was not real. For some participants, this perception of realism made it difficult to suspend their disbelief and effectively play their roles. Brooke gave this example:

> *A manikin blinks and breathes and all of that but I can't quite make that connection, you know, of taking it seriously I guess*

Although the participants perceived the simulation was not real, they experienced moments when the simulation felt real. Nonetheless, these moments were typically short-lived. This finding is presented in two sub-themes: (a) experience of realism and (b) moments of immersion.

Experience of Realism

In simulation, replicating a clinical scenario as close as possible (realism) is generally considered an important design characteristic, particularly if the learning outcome requires the participants to act as they would in a real clinical situation (INACSL Standards Committee. (2016e). The simulation environment in this research was designed to closely replicate a hospital room or clinic. In the clinic, there was a picture on the wall, chairs, and a coffee table set up with a mug, pamphlets, and magazines. In the hospital room, the simulator was on a hospital bed, dressed in a patient gown, and attached to a monitor. There was also a jug of water and newspaper on a bedside table, and patient charts and vital sign equipment available in the room. For some simulations, the simulator had a wound or intravenous (IV) fluids running. Contextual elements were also conveyed, for instance, monitor alarms sounded when the patient began to deteriorate, and the tone of the patient voice reflected the patient's changing condition.

A common theme in the interview was that despite these attempts to replicate a clinical scenario, the simulation did not feel real for the participants. Keegan and Paris explained it like this:

> *They [simulations] are not really all that realistic in a lot of ways. It is just a manikin or it is just an actor. I find them unrealistic anyway, you're never going to get a manikin like a real person* ***[Keegan]***

> *In clinical, it's, real people, real situations, real feelings and they've got real things wrong with them … It would be helpful if simulation, could be more realistic but then I don't know how much more realistic it could be without being actual clinical* ***[Paris]***

At the time of the first interview, Keegan and Paris had spent at least twelve weeks in the clinical setting caring for 'real' people in a 'real' environment. Experiencing the emotional connections, and the noises and distractions common in the clinical environment may explain

their comments. Likewise, Riley said simulations did not feel real. She also explained that this lack of realism meant her behaviour in simulation and clinical practice differed:

> *It just seems like it is quite an unreal sort of situation and I don't feel like I behave like I would in a real-life situation* ***[Riley]***

These examples show that despite a significant effort to replicate the clinical scenario, Keegan, Paris and Riley were not moved by the set up. Their perception of realism also seemed to affect their willingness to leverage the learning opportunities simulation offered. For example, Riley said simulations were "*a very limited learning environment*" and she would "*prefer to be doing something else*." Paris believed simulations did not help her learn and Keegan said, "*simulations aren't my thing*."

In comparison, Rose and Heather explained:

> *It does not necessarily feel real, but I find it is important to treat it as real to get the most out of it… it's taken as quite a serious thing which is good because it makes you act how you think you may act in the clinical if it was to happen* ***[Heather]***

> *I think it's better to practise our skills in a safe environment as well as in clinical because obviously simulations are never going to quite be as real as in a clinical setting but I think it does help to prepare a lot of our assessment skills before we actually go out to clinical* ***[Rose]***

Heather recognised that, to make the most of the learning opportunity, even if the simulation did not feel real she needed to act as though it was. Heather's experience supports the argument that participants' experiences of realism in simulation are not just about how real the simulator and environment look, but also whether the participants "buy in" to the experience (Hamstra, Brydges, Hatala, Zendejas, & Cook, 2014, p. 388). Likewise, Rose's example above shows she was prepared to accept the simulation was not real because she believed it was a valuable learning opportunity. Her experience is consistent with the ideas of Muckler (2017) that a determining factor as to whether a participant immerses in the simulation is a personal acceptance that the higher purpose of simulation is learning.

The experiences of the students in this study reflect the argument that realism is a multi-dimensional attribute that encompasses physical, psychological and social aspects (Hamstra et al., 2014), such as the willingness of the participant to suspend disbelief and participate despite the limitations of the simulator or environment (Muckler, 2017). This finding is also consistent with the argument of Hamstra, Brydges, Hatala, Zendejas, and Cook (2014) that successful learning experiences in simulation are not just about the student's perception of realism, but rather their willingness to play their role, connect with others and attempt to apply their knowledge and experience to the scenario. Based on the above examples from the students in this study, students' learning experiences in simulations are influenced by their willingness to suspend disbelief and perform their allocated role, despite their perceptions as to whether the simulation feels real.

Moments of Immersion

Data analysis indicated the primary reason some participants found it difficult to suspend their disbelief in simulations was the absence of critical elements such as behavioural and social cues. For example, Brooke said she had to "*dig deep to imagine she was talking to the manikin and not the voice behind the screen*." Jill said, "*it was weird talking to a manikin*" and according to Ginny, "*it is a dummy that looks the same every week*." However, despite these limitations, five participants said there were moments in the simulation that felt real. For example, Ginny said the simulation feels real "*when lots of stuff starts happening … it sort of kicks in*." Paris said it feels real until the simulation goes off track because when this happens, she "*remembers others are watching*." Brooke explained:

> *You jump in and out of role [because] the manikin is kinda staring at you and they have stared at you for the last 10 minutes*

Rose experienced a degree of realism when the monitor alarms started beeping:

> *You know it's really serious and you're hearing these bells going off and everyone's got their own job to do and you're kind of not even aware of what you're doing, you're just doing it without thinking … even though I know it's a simulation, you don't want your fake patient to die*

The examples from Brooke and Rose show that, although they experienced moments of realism, these were typically short-lived and interrupted by factors such as making a mistake

and the simulator's lack of movement. Rose's comment that she did not want her fake patient to die also indicates that, at some level, she connected with the simulation. This finding supports the argument that realism cannot be predesigned because participants' experiences of realism are the result of interactions between the simulator, participant and context (Rystedt & Sjöblom, 2012).

The INASCL simulation glossary terms moments such as those described by the participants as "simulated clinical immersion" (INASL Standards Committee, 2016a, p. 45) and defines immersion as being engrossed in the situation as if they were in the real world. Clinical immersion is thought to be beneficial in simulations because, in an immersive state, students are more likely to respond as they would in clinical practice (Muckler, 2017). Immersion is also thought to induce an emotional and psychological response similar to a clinical event (Rudolph et al., 2007).

The following example from Ashley, illustrates the complexity of the immersion concept:

> *I sort of did feel like the dummy was the person, like the observations were real. Does that make sense? Looking at the observations was keeping it real … I just remember stroking her forehead and being, like, 'it's going to be okay'. You just want to give them that calmness, that reassurance… plastic skin is weird, it doesn't have any warmth to it.*

In this example, Ashley calls the patient a 'dummy.' She then talks about wanting to reassure the 'dummy' and in the last sentence she reverts again to the patient being 'plastic.' This example indicates Ashley experienced moments of immersion despite the physical limitations of the environment. Also interesting is her comment 'the observations were keeping it real,' which, for this simulation, included an increased respiratory rate, tachycardia and decreasing oxygen saturation (displayed on the monitor). It seems for Ashley, her experiences of realism were fluid.

The three dimensions of realism described by Dieckmann, Gaba, and Rall (2007) may explain this example from Ashley. These three dimensions relate to physical realism (the replication of the physical aspects of the simulation), semantical realism (the simulated concept and its relationship, e.g., the cause of angina is chest pain) and phenomenal (the feelings and beliefs participants experience in simulation). Dieckmann and colleagues suggest participants can

suspend disbelief in regards to physical realism as long as they interpret the simulated concept as real. Ashley's experience reflects this when she explained that despite the manikin being plastic, the observations and context were keeping it real. Dieckmann and colleagues also argue that for the simulation to feel real for the participant (phenomenal realism), the clinical scenario needs to be integrated into the simulation setting. In other words, if the simulated scenario is about septic shock, portraying the most likely physiological parameters of shock (low blood pressure, increased pulse, and a cold clammy patient) is the most important aspect and a highly realistic simulation environment may not necessarily be required. Phenomenal realism is particularly important if the intended outcome is the development of clinical judgement because portraying expected and also changing physiological parameters for a clinical scenario is the basis for cue recognition, interpretation of cues and response.

These students' experiences show moments of immersion are possible, yet not easy to achieve. Therefore, rather than emphasising replication at any cost, educators should select the most appropriate and cost-effective resources to meet the learning outcome of the simulation. For example, if the purpose of the simulation is skill acquisition, the use of task trainers may be sufficient. If the aim is to help students problem-solve, written physiological parameters might be adequate. However, if the intended outcome is to induce a personal response to a complex clinical situation, then immersion may be more important. For example, the first time a student witnesses a patient seizure may be quite frightening, yet this situation can be reasonably simple to simulate using an actor. Likewise, the feelings of adrenaline that accompany a rapidly deteriorating patient can be intense. If a student experiences this feeling in a simulation, the facilitator could debrief this reaction to prepare participants for clinical practice.

In summary, these findings suggest that the students' perceptions of realism influenced their learning experience in simulation. Participants who hold a view that a simulation cannot replicate real-world practice may find it difficult to suspend their disbelief and make the most of the learning opportunity. Baxter et al. (2009) describe participants with this view as "reality skeptics" (p. 861). The notion of a 'reality skeptic' may explain why Keegan, Paris and Riley found it challenging to suspend their disbelief and also their comment that they did not learn much in simulations. To help 'reality skeptics' engage, educators should remind participants that simulations are not meant to be real and encourage them to make the most of the opportunity to practise without patient risk.

COMFORT WITH ROLE–PLAY

The participants in this research were required to role-play a clinical scenario in their simulations. This role-play occurred in a dedicated simulation room designed to look like a hospital ward or outpatient clinic. A simulator played the patient in the medical/surgical simulations and an actor in the mental/primary health scenarios. As mentioned in chapter three, the students were allocated one of four roles: nursing student, registered nurse (RN), observer or relative. The roles of registered nurse or student nurse were the more upfront roles as the other two roles mostly involved observation. Seven students talked about role-play in simulation. For example, Mary laughingly said, "*she never went to acting school*." Ginny described her simulation experience as "*playing a character*" and pointed out that a student in her group changed her voice in simulation. Brooke described simulation as a "*role play where you don't know your lines or what goes next*."

As these examples show, role-play is central in the simulation of a clinical scenario. To play their assigned role the participant must be willing to suspend disbelief and create an inner artificial reality. However, the emphasis in the simulation literature in regard to realism does not typically take in account the participant's ability to suspend disbelief and act a role (Muckler, 2017). It is generally assumed that all participants are capable of role-play as long as they are willing. Based on the experiences of the students in this study, the ability to suspend disbelief could also depend on one's ability to role-play. If a participant finds role-play difficult, this may affect their performance in the simulation and consequently learning opportunities. Ashley gave this example:

> *If you're not really into drama, it's really hard to make it feel like it is real, this is actually happening … If you're in that real sort of drama mood you can make it more real for yourself*

Two participants found role-play particularly challenging. Riley disliked role-play because this required her to perform a role in front of others, and Keegan believed she was not good at it:

> *I can't stand role play, don't like acting, don't like role play … I don't like that side of it at all. I'd prefer to maybe find a different way of using those facilities …I wish that part was taken out of it… I just don't like being in front of people, being in a role* ***[Riley]***

I don't like role play, not something I've ever enjoyed or been good at it's just not something I've ever been good at ***[Keegan]***

By comparison, Jill enjoyed role-play. During my observations of the simulations, Jill appeared enthusiastic, talkative and she laughed a lot. She repeatedly took the lead roles and supported her less comfortable peers. Jill's comfort with role-play was reiterated in the interview when she said she enjoyed simulation because she was a 'dramatic' person. She explained it like this:

I think some people might not have that characteristic [to enjoy role play] and feel stupid talking to a manikin and developing a therapeutic relationship with a manikin as we're meant to. But I do because I've always been a dramatic kind of person. I like to make people laugh

By contrast, Keegan appeared very uncomfortable in simulations. She was unable to answer questions posed by the facilitator; her face was bright red, and she appeared to stare blankly at the unfolding situation. Keegan's anxiety seemed to significantly influence her ability to play her allocated role and immerse herself in the learning opportunity. Her comment in the interview supports this observation:

I just get so anxious and wound up, I go in there and I can't remember anything most of the time. I don't know if I'm learning much from it… maybe it's just because I find them unrealistic anyway

The ability to role-play is a crucial aspect of learning in a simulation of a clinical scenario. However, the experiences of Jill and Keegan indicate those who are comfortable acting may be more able to maximise the learning opportunities in simulation. If a student finds role-play particularity problematic, educators might need to consider offering the student a less upfront role, such as peer-observer or relative, to reduce their stress and provide the required learning opportunity. On the other hand, educators could also use role-play in simulation as an opportunity to discuss the roles the student will play as a nurse. For instance, when caring for a patient in the clinical setting, the nurse is a comforter, listener or advocator, and these roles are played in spite of external circumstances.

Returning to Jill, although she said she enjoyed drama, she was ambivalent about the value of her simulation experiences:

> *I think you are learning but I think we kind of already have those skills from clinical and it just kind of a fake situation really (laughs), and you just go through it and it's just what it is. It's nothing, it's not a great experience … you go into clinical and you have this fantastic experience. You get to do all*

This example indicates that Jill was a "reality skeptic" (Baxter et al., 2009, p. 861). That is, she did not believe simulations could ever replace real-world practice. However, because she enjoyed role-play, she did not have a problem performing in front of people. Paris's experience was similar:

> *I wouldn't say I didn't enjoy it [simulation], like we had lots of giggles. But for learning, probably I wouldn't say it helped a lot*

These examples show that because Jill and Paris were comfortable playing roles they were able to perform in the simulation. However, their comments also suggest their perception that a simulation could not replicate clinical practice made it difficult to value the learning opportunity. To help students like Paris and Jill make the most of the learning opportunity, acknowledgment in the pre-briefing that the simulation is not meant to be real and encouraging students to use this aspect to their learning advantage, is probably important. Educators may also need to guard against an assumption that if a student performs their role well in the simulation, they are actively engaged in the learning opportunity. Instead, educators need to consider ways to help all students recognise that although simulation and clinical practice are different learning contexts, both environments offer learning opportunities, as long as there is a willingness to engage.

It may be difficult to predict a student's level of comfort with role-play because learners bring diverse personal backgrounds to their simulation experience (Durham, Cato, & Lasater, 2014). However, this characteristic is critical for the development of clinical judgement skills in simulation because students are more likely to be engaged when in a role. Interestingly, the literature about roles in simulation does not typically take into account the participant's ability to role-play (Adamson, 2015; Durham et al., 2014; Harder, Ross, & Paul, 2013). This lack of discussion indicates that the relationship between role-play and learning in simulation requires further investigation. Keegan's experience also suggests that in addition to being willing, a participant must also be able to role-play. Therefore, fundamental to an enhanced learning experience in simulation is a willingness and ability to role-play in front of their peers.

PREPARATION FOR THE SIMULATION

The participants were prepared for their simulations with an online-learning package to complete the week before the simulation. Included in the package were learning objectives for the upcoming simulation, pre-readings about the topic, and activities such as quizzes to complete. All of the participants said this preparation was important. However, some participants prepared more than others. Participants also talked about the influence of their preparation on what they noticed and also their response. This finding is presented in two themes: (a) expectations, and (b) motivation to prepare.

Expectations

Engaging participants in pre-simulation activities to prepare them for the simulation is increasingly common (Chmil et al., 2015; Coram, 2016; McDermott, 2016; Page-Cutrara & Turk, 2017). As mentioned, these participants were required to complete an online learning package before the simulation. Several participants talked about the expectations this preparation created. For example, Heather said, "*we go in there with a bit of an idea of what may happen*." Ashley explained, "*because you prepare so much, … you can kind of guess what the situation is going to be and how it is going pan out*" and according to Paris, "*when you are doing the pre-readings, you have something in your mind of what it is going to be*." Riley gave this example:

> *I pretty much knew what was going to be happening in the simulations before I went in there anyway, I mean I hadn't been told, it was just from reading the situation in Moodle [online platform]*

While expectations can be helpful in that participants can plan their responses, they can also be problematic if the simulation does not evolve as expected. For example, Brooke said it was "*distracting*" when the simulation "*didn't pan out*" as she anticipated. Rose said that in one simulation, she was not expecting to do a drug calculation and when she realised this was required, it "*threw her*." Ginny said when the patient does not have the symptoms she expected, it was "*all over*." Mary explained:

> *You go in and you think, oh this is going to be what happens and then when it doesn't happen, it is hard because you just get stuck and you freeze*

The examples from these students suggest participants may find the simulation challenging if it is not as they anticipated. This finding is consistent with those of Najjar et al. (2015) and Shorten and Ruppel (2017) that students could become anxious if the simulation unfolds differently from their predictions.

The participants also spoke about the influence of their expectations on their assessment of the patient and response in the simulation. For example, Heather said she looks for the "*cues and the side effects*" she read about and she starts simulations with a "*slight plan*" in her head. Bailey said, because the pre-reading was about oxygen, she was "*attached to the oxygen*" and "*fixed on the fact that it has to be the thing to do*." Rose explained:

> *I think our whole group got tunnel vision because you do readings on a few things which basically gives you the idea of what the simulation is going to be on. So we went in with this is what's going to start happening, so we'll just do this and this … So I think sometimes that does narrow our vision into where we're going to go. We forget to look at what other possibilities it could be*

These examples show that because of their expectations, Heather was looking for the cues she expected to see, Bailey was fixated on an intervention not required and Rose did not consider all the possibilities in the simulation. This finding may explain my observation that the students seemed to miss an obvious cue in one of the simulations. This simulation commenced with the patient (a simulator) halfway down the bed with her leg out, uncovered. It would be reasonable to expect the nursing student would recognise this cue and consider the falls risk for this patient. However, most of the students did not notice this cue. Instead, when they first walked into the room, they either quickly put the leg back under the sheet or left the patient in this awkward position until later in the simulation. When I asked the students about this simulation, most said they thought the manikin had just slipped down the bed. One student said she did not notice the cue because she expected everything to be okay at the beginning of the simulation because, in her experience, the patient's condition does not usually deteriorate until later in the scenario.

Other researchers have reported similar findings that participants may have difficulties recognising cues in simulations. For example, Endacott et al. (2010) found that students focused on a specific cue provided in the scenario information, at the expense of other cues. Bogossian et al. (2014) investigated students' situation awareness in simulation (students'

perception of the elements in the environment), and reported students' scores were low. These researchers concluded the reason for low situational awareness in simulation was uncertain, although they acknowledged anxiety and stress might play a role. Based on the experiences of the students in my study, another explanation could be that some cues are missed in simulations because of the students' expectations.

To lessen the influence of expectations on what a student notices in the simulation, educators could choose to not prepare students immediately before the simulation. However, for novice learners, commencing a simulation unprepared may be quite daunting as they have limited experience and knowledge to draw on. Further, findings from other studies show preparation for the simulation expands the student's learning experience (Chmil et al., 2015; Lasater et al., 2014; Page-Cutrara & Turk, 2017). Therefore, preparation is not the problem but rather the expectations this may create. In her clinical judgement model, Tanner (2006) talks about the influence of the nurses' expectations on their initial grasp of a clinical situation. Educators could therefore use simulations to help students understand about the effect of expectations on their assessments of patients in clinical practice and encourage them to broaden their assessment and response. Educators could also consider introducing nursing students to simulations without prior preparation as they progress through their education. This approach is more similar to the clinical setting where students do not know what they will face and are therefore, required to draw on a range of knowledge and experience. Andy illustrated this in the following example:

> *In clinical, you don't know what you're going to be doing during the day … with simulation … you get time to actually prepare and you have a general idea of where you're going to have respiratory, cardiac … With clinical, it can be quite spontaneous in terms of what you get*

The idea of scaffolding the design of the simulation according to the development stage of the student is revisited in the final chapter of this thesis (chapter seven).

Motivation of the Student to Prepare

All 12 participants talked about their preparation for the simulation. For Heather, the online preparation before her simulation refreshed her knowledge and helped her "*feel okay*" about the approaching simulation. Jill explained the online preparation was helpful because she knew

"*what you are going to face in the simulations*" and Mary said, "*if you did not do the reading, you would be very stuck*." Andy explained:

> *The good thing about being in simulation is that you get time to prepare and you get to think more in depth, so therefore you get to recognise what's going on … in our group, we used to do that together and gain some idea around what we were doing*

These examples show that the participants valued the preparation because they could plan how to respond in the simulation. Further, knowing they were about to play their role in front of others motivated them to prepare well. For instance, Mary said, "*if you didn't do the reading, you'd be very stuck*," and according to Heather, she prepared as well as she could "*because of those nerves*." Ashley explained:

> *You don't want to look like a dick [laughs] when you don't know something. So you try to get all the stuff into your brain to show that you prepared for this*

Bailey prepared extensively:

> *When they say it's usually one or two hours' prep, I tend to take longer … like my sims have been at two o'clock and I usually spend the whole morning on it and then write down thoughts when I have them, like I should try and address that… I'd find it really overwhelming if I hadn't done any prep*

Different reasons could explain why Bailey prepared for the simulation to this extent. She was slightly older (age 24), nursing was her second choice after completing two years of a dietetic degree at university, and she spoke about perfectionist tendencies. Bailey was also a highly driven student who approached most of her study this way:

> *When it comes to studying, I tend to read up on some things really well … I know some of the content really well. I don't know if that's a perfectionist tendency or not … On simulation rotation, I had a lot more free time so I would be able to spend lots of time reading up on it*

Other researchers have identified a relationship between preparation for the simulation, motivation and anxiety (Beischel, 2013; Gantt, 2013; Najjar et al., 2015). However, the

findings are conflicting. For example, Gantt (2013) found preparation may reduce anxiety. On the other hand, Beischel (2013) found that students who prepared at length experienced more anxiety which may be exacerbated if they realise their preparation was insufficient. Likewise, Najjar et al. (2015) suggested that students who prepared extensively may feel inadequate if they make a mistake in the simulation, which could explain the following comment from Bailey:

> *I think I build up an expectation of myself, like, I think I'm comfortable with this, I've had all these thoughts of what I can say in it and then it's quite disappointing when you leave and you're like, damn it, I missed nearly half of what I thought I should mention*

Based on this example, the reason Bailey prepared extensively was her high personal expectations of herself. She was therefore, internally motivated to complete her pre-work and, consequently, more ready to learn in the simulation. In comparison, other participants' preparation was dependent on the role they expected to play:

> *I wasn't expecting to have the main role at all. I mean I had done my readings but I probably would've done more if I'd known I was going to have the main role … I was expecting to be observer* ***[Riley]***

> *If someone didn't turn up and we'd already organised roles, it just proved that you can't not do the readings just because you're a family member which I think a few of our members did* ***[Rose]***

Riley's example below also suggests that if a student's preparation is dictated by the role they expect to play, this could be problematic if they were assigned a role they did not anticipate:

> *I ended up having the main role and I thought oh no, okay. Just do it but I wasn't quite mentally prepared for that*

Choosing not to prepare, also had the potential to affect other students' learning experiences because simulations involved group-work. Ashley gave this example:

> *Last year I don't feel like I gained much out of simulation. I felt like there was only one or two of us that would actually do the preparation for it which put more pressure on you*

COLLEGIALITY AND TRUST IN THE SIMULATION GROUP

The nursing students undertook their simulations in groups of three or four with their peers in the same year level. The students were assigned to a simulation group at the beginning of the year and participated with these same students all year. All of the participants talked about the influence of their designated group on their simulation experience. A shared feeling was to get the most out of the learning opportunity, collegiality, supportive peers, respect and trust in the group was essential. For example, Heather said it was important to "*feel respected and not judged for what you're doing or saying in the simulation*." Brooke explained it was "*feeling supported*" and "*having a connection*."

The participants also spoke about the advantages of participating in the simulation with their peers. For Ginny, it provided "*backup or someone to bounce your ideas off*." Heather said participating with her peers was "*good, just like two brains, it backs you up*," and Rose explained, "*we want our team members to do well, so we give each other an odd hint if we see them struggling*." For Keegan, learning with her peers was "*reassuring*" because she felt she had "*backup*." Jill gave this example:

> *It's definitely good to look after each other, to support them because if they're going in there completely shot, they are not going to get much out of it … I let them know that you are always going to back them up and help them if they get stuck or their mind blanks*

These examples illustrate that the students' peers were a valuable source of support in the simulation, especially if they were unsure how to progress. This finding reflects other literature that describes the advantages of group-learning. For example, group-learning has been shown to decrease anxiety and provide opportunities for students to share knowledge and ask others with a similar level of experience for advice (Stone, Cooper, & Cant, 2013). However, as Parker and Myrick (2012) point out, for group-learning to be effective, trust and accountability among peers is essential, especially when peer observation is involved.

Five participants spoke about the challenges when trust and accountability in their group was lacking. For instance, Ashley said that her group the previous year was "*awkward*" because her peers were "*judgemental*." She also said she did not gain much out of simulations because some in her group did not prepare. Heather spoke about a "*risk of competitiveness to do better than each other*" and Rose said she did not feel safe in her year two group:

> *It wasn't a team effort, it was like you're on your own … [others said] 'if you don't know what you're doing, then I'm not going to help you'. I don't think it was that safe an environment*

Paris talked about the effect of dominant personalities:

> *When you've got three people, there's always one person who tries to take over. I think we probably step back and let it happen because it's easier that way… I think it's easier to not cause any dramas … If there's someone who's always dominant, it's almost like you think 'oh that's what I was going to say or I actually said that but you took it for yourself'. Dynamics are quite important*

The examples show that lack of respect, fear of critique, competitiveness and unsupportive peers influences the students' learning opportunities in simulations. Other researchers have reported similar findings in regards to group-learning. For example, Azar (2009) described challenges such as poor group interactions, unequal contributions, and discussions dominated by a specific group member. Likewise, Al-Kloub, Salameh, and Froelicher (2014) talked about group conflict when members did not put in equal effort to complete the required task. These authors also pointed out that students who were success-driven, or highly competitive, may be more motivated by achievement than learning, and this may affect the opportunities of other group members to attain learning outcomes.

Four students in this study said group-learning was better when you 'knew' your group members. For example, Andy said it was helpful to have simulations timetabled close together "*because you get to know each other*." Bailey gave this example:

> *I'm lucky this time around. The two people in my group are good friends of mine and also two friends that I feel comfortable with. I can practice knowing they're not going to be judgemental. I also know them quite well so I know how they work. You have an idea of how they might approach the situation and some idea of what they might be thinking or how they might be feeling through it … Last year I was with two people I didn't know as well, so you're trying to read them through the simulation as well*

These examples from Andy and Bailey indicate that familiarity with group members, friendship, and participating with the same students over time may make it easier to foster trust. However, the earlier examples above about competitive and dominant behaviours in simulation occurred despite the students being in the same group all year. The students in this study also signed an engagement agreement about respecting their peers. Therefore, the risk of unhealthy group dynamics may be difficult to avoid because trust and respect depend on the individual characteristics of the students within the group.

There are three potential ways to manage this challenge. First, the educator could try strategies to reduce the fear of ridicule or judgement by, for example, asking students to choose their group members. This strategy may help because students can select group members whom they know and trust. However, this is not always pragmatic, and in some simulations, the participants may not meet until the briefing session. In these situations, providing an opportunity for the participants to prepare as a group before they start the simulation might be beneficial. Second, to reduce competitiveness, the educator could alter the group composition to include students at different year levels or from other health professions. However, this may also not be pragmatic and this strategy could create a power imbalance, which the educator is trying to avoid.

The third strategy is educators could use group-learning in simulation to prepare students for teamwork in the clinical setting because successful patient outcomes are dependent on well-functioning teams. For example, the facilitator could encourage the students to reflect on their experience of working with their group members and initiate discussions about how they could apply their experiences of group-work to effective teamwork in the clinical setting.

CONCLUSION

This chapter provides insights about the influence of what the participant brings to the simulation on their learning experience. Four participant-related factors were presented and discussed. These included perception of realism, comfort with role-play, preparation for the simulation, and collegiality and trust in the simulation group. In regards to perception of realism, all 12 students perceived simulations were not real. For some students, a perception that the simulation was inauthentic made it difficult to suspend their disbelief and leverage the learning opportunities simulation offered. The students also talked about moments of

immersion, however these moments were typically short-lived and not easy to achieve. Closely related was the students' comfort with role-play in that those who were comfortable acting, might find it easier to suspend their disbelief and maximise the learning opportunity. If a student finds role-play challenging, this will likely affect their performance in the simulation. Further, playing their assigned role well in the simulation may not necessarily mean the student is making the most of the learning opportunity.

Preparation for the simulation was helpful for these students because it increased their confidence to participate. On the other hand, it created expectations as to how the simulation might play out, which had the potential to narrow the student's assessment of the patient and response. Students may also find the simulation challenging if it does not pan out as expected. Further, students who were internally motivated to complete their preparation, regardless of the role they expected, were more ready to learn in the simulation. If a student chooses not to prepare, this could affect the learning experience of their group-members. Similarity, the students' experiences in simulation were more beneficial if the group culture was one of collegiality and support. Group-learning in simulation also offers the facilitator an opportunity to prepare students for team-work in the clinical setting.

These findings have implications for educators because they suggest that what the student brings to the simulation experience and how we go about simulation design are equally important to the learning opportunity. The findings also show that learning in simulation is complex. Students are required to pretend and yet respond in the situation as though it was real. They need to role-play, yet acting may have never been their forte. Further, both preparation for simulation and group-learning could be helpful yet they may also distract from the learning opportunity. Based on these students' experiences, educators need to acknowledge and account for factors such as the amount of time students have spent in the clinical environment, and number of previous simulations, in the planning and facilitation of the simulation. Educators could also remind students in briefing that simulations are not meant to be real but they offer valuable learning opportunities as long as they are willing to engage.

Strategies to prepare students to learn in simulation include a discussion of expectations during the briefing, encouraging students to broaden their assessment of the patient and response, and supporting students to manage group dynamics. Educators also need to consider what realism

is trying to achieve and select the most appropriate resources to meet the learning outcome of the simulation.

In closing, there are still unanswered questions about how educators should prepare learners for the simulation experience (McDermott, 2016). Nonetheless, McDermott recommends the pre-briefing should be planned and facilitated by someone who is familiar with the characteristics of the learner in regard to level, profession, and programme. Based on the students' experiences in this study, educators also need to consider the influence of the students' perceptions of realism, comfort with role-play, and expectations, as well as the group culture on the learning experience, and address these in the design of the simulation. Factors such as student buy-in and the use of a learning contract are important aspects to consider (Muckler, 2017). However, why some students find it easier than others to immerse themselves in the simulation is unknown. These students' experiences suggest achieving 'buy-in' in simulations is complex, yet if one could capture the moments of immersion these students described, this may enhance their learning experience in the simulation. Immersion may be particularly important if the purpose of the simulation is clinical judgement development because this outcome requires students to respond as they would in a clinical situation and reflect on their actions. Chapter six revisits this point.

The next chapter (chapter five) is the second chapter to present the research findings. The focus shifts from participant-related factors to the students' experience of the facilitation approach.

CHAPTER FIVE: STUDENTS' EXPERIENCES OF FACILITATION IN SIMULATION

INTRODUCTION

The previous chapter (chapter four) discussed the influence of participant-related factors on students' learning experience in simulation. This chapter highlights the influence of the facilitation of the simulation. This chapter continues to draw on the data obtained from my observation of ten simulations and student interviews. Two key themes in regards to the facilitation of the simulation were identified:

1. The unintentional effect of lecturer observation
2. The facilitator's approach

The first theme, the unintentional effects of lecturer observation, refers to the effect of a hidden lecturer on the students' learning experiences in simulation. The unintentional effects included performance anxiety and fear of making a mistake. The second theme, the facilitator's approach, closely relates because hiding the lecturer meant the students were separated from the expert nurse; and because they were novice learners, this approach to facilitation did not provide them with enough support. The students also spoke about their experiences of receiving feedback on their performance in the debriefing session as well as the potential of simulation to induce an emotional response. Consequently, the lecturer's approach to facilitation greatly influenced the students' learning experiences in simulation.

THE UNINTENTIONAL EFFECT OF LECTURER OBSERVATION

In the simulation of a clinical scenario, the primary purpose of lecturer observation is to gather information to provide the students with constructive feedback on their performance and facilitate debriefing to enhance their clinical thinking (Tapler, 2017). A lecturer can also use observation to support students by providing cues if they seem unsure how to progress in the simulation (Paige & Morin, 2013; Kelly & Guinea, 2018). Lecturer observation is therefore an important and valid aspect of facilitation in simulations. However, for the students in this study, being observed by a lecturer posed some challenges. These challenges were related to the process and structure of this observation. First, the lecturer facilitating the simulation was hidden and second, one of the responsibilities a lecturer held in the nursing programme was to

assess students' competence for nursing practice. These factors created two unintentional outcomes for the students; performance anxiety and fear of making a mistake.

Performance Anxiety

A key outcome of observing the students in simulation was this environment appeared to induce a high level of anxiety. Anxiety was particularly noticeable during pre-briefing when the students' body language exhibited varying levels of unease. For example, some students were observed anxiously glancing at their preparation notes and then hurriedly putting these into their pockets or bags. Although the atmosphere usually became calmer as the simulation progressed, the students seemed to fluster easily if unsure what to do. This observation was confirmed in the interview when 9 of the 12 students talked about anxiety. Riley and Ginny spoke about their anxiety like this:

> *I remember being so nervous with my first one. Just about shaking nervous … I can't even remember what the subject was, just the feeling and coming out of it thinking, well it wasn't that bad (laughs) it was fine … but by this block here, it's definitely much more relaxed and you know what you're getting yourself in for* ***[Riley]***

> *Going into sim, you're so wound up. You know what you have to do and afterward you're like, oh. I always feel really wound up. It's getting a lot less than what it was in year two and the start of this year. You feel so nervous, you feel sick for the whole day. Like, everyone's going to be watching me and watching what I do. But the last three sims, I've managed to switch my thinking into, … this is what I know, and I'm trying to do the best with what I have. … The nerves are definitely getting less and less* ***[Ginny]***

Riley's example suggests the cause of her anxiety was not knowing what to expect. For Ginny, it was a fear of being watched, and as she gained confidence, her anxiety lessened. Riley and Ginny's experience supports previous research that found students' anxiety decreased as they progressed through the nursing programme (Hope, Garside, & Prescott, 2011; Najjar et al., 2015) and that the fear of the unknown and fear of critique induces anxiety (Cordeau, 2012; Paige & Morin, 2015; Shearer, 2016). To reduce anxiety, many authors recommend educators prepare students for the simulation, orientate them to the environment, and provide clear

expectations and goals of the learning experience (Gantt, 2013; Najjar et al., 2015; Rudolph et al., 2014).

The nursing school in this study employed many of these strategies. For example, the students completed an online self-learning package the week before the simulation, the facilitator orientated the students to the environment, and in the first year of the nursing programme, the students watched a video of third-year students participating in a simulation. To promote trust and encourage participation, the students also signed a confidentiality and engagement agreement. Despite this preparation, some students experienced anxiety significant enough to interfere with learning. For example, Mary said, "*you would be so nervous that you would just forget what you are supposed to be doing*." Brooke commented that simulations were so "*daunting*," her "*mind just goes blank*," and Keegan explained:

> *It might be just like stress in the situation and knowing you're being watched. I get so anxious and wound up, I go in there and I can't remember anything most of the time. I don't know if I'm learning much from it. … As soon as I walk in that room, it just all flies out. We meet up beforehand, talk about it, bounce ideas off each other and reassure each other. Then you go into the room and I just blank out*

Analysis of the data suggests several factors contributed to the students' anxiety. First, some students worried about how those watching (peers, technician and a lecturer) viewed their performance. For example, Riley said she just wanted to "*get to the end somehow without looking too silly*." Second, being observed by a lecturer created a pressure to perform well. For instance, Heather said she was "*nervous*" because she wanted to "*do a good job*" and Ginny explained she wanted to "*impress, because in debrief they tell us the good and the bad*." Third, four participants said simulations put them "*on the spot*." Jill explained it like this:

> *[In clinical] you don't need to know it right on the spot like I can just go away and find out from whoever's handy …because they're watching you and you want to know right on the spot*

These students' experiences are consistent with the findings of Parker and Myrick (2012) that students felt "put on the spot" (p. 370) in simulations. These authors likened observation in simulation to that of "performing in a fishbowl" (p. 368) and noted that students often

experience stage fright, fear and a sense of judgement. Similarly, other researchers have reported that students fear critique (Beischel, 2013; Paige & Morin, 2015; Shearer, 2016) and that being watched by a person in a position of authority is likely to induce anxiety (Shearer, 2016; Najjiar et al., 2015).

Jill's example above offers a possible explanation as to why students may feel put on the spot in simulation. That is, in clinical practice, if a student is unsure what to do they can find someone to ask. Whereas in simulation, there is often a pressure to respond immediately and if the lecturer is hiding behind a one-way window, respond without expert assistance. The effect of this one-way window was talked about by five students. Jill gave this example:

> *I don't remember simulation (in first year), but I remember going in before like, the lecturers are going to watch us behind the mirror. I think they showed us a video of third-years doing a simulation and that was pretty scary*

In this example, Jill mentions the video shown to the students as part of their orientation to the simulation environment. The purpose of the video was to decrease student anxiety by showing them what to expect. However for Jill, it seems the footage increased her anxiety because she realised that observation from behind a window was involved. Mary and Paris also talked about the effect of the one-way window:

> *You're always thinking that the person behind the window is watching you and they're going to know what you're doing wrong* ***[Mary]***

> *Looking at the two situations [clinical and simulation], I guess the differences are that there's a mirror there and someone's watching you … when you're in clinical, you know that your preceptor, like even though they might not be obviously there, you know that they're always there … they'll be listening… it's not quite as obvious as the big glass where you know someone's watching and judging* ***[Paris]***

These examples suggest that it is not necessarily observation that causes anxiety but rather being watched by someone you cannot see. This response is not surprising because hiding the lecturer means the student cannot make eye contact, see the evaluator's body language or hear what those behind the window are saying. In other situations, such as clinical practice, the physical response of the observer provides the student with cues as to how they are performing.

For example, an encouraging smile if they are doing well or a puzzled look which may cue the student they are about to make a mistake. Students can then adjust their actions in response. In simulation, hiding the lecturer creates evaluative uncertainty because the student does not know how they performed until the debriefing session. These factors may explain why Ginny and Ashley said they felt judged in simulation:

> *Even though you guys tell us we're just being observed, it does feel like that we're still getting, you know, watched and judged* ***[Ginny]***

> *I know we're not technically getting judged but you still feel like it … not in a sense like they're judging me to be good or bad. I don't know how to explain this. It's real weird… I think you're so worried about what everybody else is thinking of you* ***[Ashley]***

The feeling of being judged is perhaps understandable when one considers one-way windows are also used for interrogation or suspect identification in criminal investigation. It may also explain why Keegan and Paris struggled with the hidden lecturer aspect of simulations:

> *I don't agree with the way we go about them. I think you could get the same learning if it was less formal and you felt less under surveillance* ***[Keegan]***

> *It's more of a supportive environment on clinical. Not that it's unsupportive here but I wouldn't call it supportive in sim … I don't know, maybe it is that room that's so scary maybe if it was in the labs where it's more of an open environment, maybe that would make it more supportive* ***[Paris]***

Stationing the facilitator behind a one-way window is widely practised in simulations (Leighton, 2017). According to Leighton, one reason for stationing the lecturer behind a one-way window is learners can perform autonomously without interference. Although experienced practitioners may feel comfortable with this approach, as Leighton rightly points out, novice learners need more immediate answers to their questions and assistance with skill technique. The students in this study were in the final year of the degree programme and according to Benner's (1984) developmental stages, they are advanced beginners. At this stage, the student is beginning to understand principles and adjust their actions in response; however, their ability to recognise all aspects of the situation in context is limited because they still tend to concentrate on the rules taught in the classroom. Accordingly, they still need guidance and the

close support of an expert to grasp the nature of the situation and apply the rules in context (Benner et al., 2009b).

Based on these students' experiences, one could presume students would be less anxious if the lecturer was not hiding. Kable, Arthur, Levett-Jones, and Reid-Searl (2013) reached a similar conclusion suggesting that a possible reason students found it challenging to manage a deteriorating patient in the simulation was that the facilitators were in the control room. Likewise, Crary (2012) suggested the main reason stress was higher in simulation compared to other environments was the unavailability of the facilitator for guidance. The findings from these researchers and the experiences of the students in this study, suggest educators need to consider the effect of lecturer observation for the student and implement strategies to decrease anxiety in simulations.

Fear of Making a Mistake

The second unintentional effect of lecturer observation identified in the analysis was some students might fear the consequence of making a mistake in the simulation. This fear could be problematic because to reflect on their actions in the simulation, students need to be willing to experiment with their ideas. Eight students talked about the effect of making a mistake in simulation. Ginny and Andy gave these examples:

> *If you slip up and forget something, then it makes you really flustered and you're like, 'oh, what have I done?'* ***[Ginny]***

> *You don't want to muck up in front of your tutors* ***[Andy]***

The students in this study were reassured during the briefing that the simulation was a safe place to practise without the fear of patient harm. The facilitator also encouraged the students to try out their ideas. However, these examples above indicate Ginny and Andy perceived making a mistake in simulation could be detrimental.

For Brooke and Bailey, the fear of making a mistake seemed to relate to the fact that the lecturer observing them could at some stage be assessing their competence for nursing practice. They explained it like this:

> *You know you're not getting marked on this, but you've got lecturers who are talking and will talk. You know it is supposed to be a learning experience but*

obviously, in year three, they will start to see whether your skills are developing or not. So maybe that pressure as well ***[Brooke]***

Coming into third year when everyone is thinking about jobs, people can re-orientate how they place simulation. They can think of it as more of an opportunity to prove yourself to the teachers … because it was third year, I was more aware of how much they might be critiquing me ***[Bailey]***

These examples suggest Brooke and Bailey were concerned that if they made a mistake in the simulation, this might cloud the lecturer's judgement in future assessments. These two students allude to a potential dilemma faced by undergraduate students when a lecturer observes them in simulation that is, to graduate from the nursing programme, students must be deemed competent. In New Zealand, this means students need to demonstrate they have met the nursing council competencies (Nursing Council of New Zealand, 2016). Consequently, at various stages during the degree, students are assessed by a lecturer as to whether they are meeting these competencies and awarded a pass or fail. For some participants, experimentation in the simulation could therefore be risky. Mary and Bailey explained it like this:

I know it's a safe environment but I still don't want to risk doing something wrong … you're always thinking that person behind the window is watching you ***[Mary]***

If you absolutely stuff it up then that's part of the learning process. You shouldn't see it as a failure but a lot of the time, I see it as a lot of pressure to not stuff up ***[Bailey]***

These students were watched by a lecturer in other teaching and learning situations such as the skills laboratory and clinical practice. However, these environments did not seem to induce the same level of anxiety and fear which raises a question as to why. A potential explanation is that in simulation, the student's actions are in the spotlight for feedback purposes. Therefore, if they make a mistake, there is a high chance the lecturer will notice. Further, as mentioned earlier, the students could not see the body language of the lecturer, which creates evaluative uncertainty, and a potential lost opportunity to avoid a mistake. These students' experiences are consistent with those of Beischel (2013), who found students feared failure, and also Najjar et al. (2015) and Cato (2013) who identified anxiety was related to a fear of making a mistake.

The extent to which a student fears making a mistake in simulation could also be related to how comfortable they are with risk-taking and failure. For example, the background of some students may have conditioned them to avoid failure at all cost, whereas others may enjoy the challenge of a risk and see failure as a platform for growth. Likewise, a willingness to experiment could be related to the student's perception of lecturer observation. For example, both Andy and Rose said lecturer observation did not faze them:

> *I don't mind being like watched in a simulation because obviously in a clinical setting, you're going to have an RN watching over you … I think it's quite nice to work under the lecturers because you know them and you know that they're not there to make you feel bad or tell you you're doing something completely wrong, that you shouldn't be a nurse. You do feel safe working under them because they do help you out a lot* ***[Rose]***

> *They [lecturers] are there to help you learn. I only get slightly nervous because you are performing slightly to meet expectations. But at the end of the day I do consider it a learning experience as opposed to an assessment* ***[Andy]***

These examples show that both Rose and Andy viewed observation by a lecturer as helpful, therefore they were less anxious about being watched. Students with this mind-set may also feel more comfortable experimenting with their ideas in the simulation. For example in her earlier examples, Bailey said she did not want to "*stuff up*" because she feared the consequences, yet she also appreciated the opportunity to try out her ideas in the simulation:

> *Knowing you can just go in there and try and know that if you fail, it doesn't matter. You could deliberately just try an angle and see if it works and if it doesn't work, then it doesn't matter. So you can try different things, thinking, or different techniques*

Riley and Andy provided similar examples:

> *It's a bit of a scary situation, not scary, that's too strong a word but knowing what you're going to do, what you need to be doing once you go in there and at least trying to do it. You might not be totally successful but you're giving it a shot* ***[Riley]***

The good thing about sim is it is a safe environment to actually extend out to that uncomfortable zone and see how that goes in a safe environment because there's going to be no consequences ***[Andy]***

These students' experiences suggest it is not necessarily observation that hinders experimentation but rather the student's perception of this observation and their willingness to take risks. This finding resonates with the discussion in the previous chapter (chapter four) that participant-related factors affect the students' experiences in simulation. Therefore, the facilitator needs to take into account the individuality of the participant and seek to foster an environment where all participants feel comfortable experimenting. A personally-safe climate is particularly crucial if the intended outcome is clinical judgement development because this outcome requires students to experiment with their ideas and reflect on the result of their actions (Tanner, 2006). Potential strategies are suggested in chapter seven.

In summary, educators need to consider what is to be gained or lost by hiding the person with expert knowledge in another room. The experiences of the students in this study suggest this approach does not offer enough support and they may become overwhelmed. Hiding the lecturer also creates a missed opportunity for real-time coaching to help students recognise salient aspects of the situation, reflect in action and respond appropriately. If the intended outcome of the simulation is the development of clinical judgement skills, educators also need to take into account that students may fear failure and plan for this potential in the design and facilitation of the simulation.

THE FACILITATOR'S APPROACH

All 12 students talked about the facilitation approach in their simulations. A shared feeling was that students wanted more support from the lecturer, especially when they were unsure what to do. While this support is important in all teaching and learning settings, it is particularly crucial in simulation because, as alluded to in the previous theme, learning in simulation could be stressful. The participants also spoke about their experience in the debriefing session, specifically, the way the facilitator provided feedback on their performance and the potential of a simulation to induce an emotional response. This finding is presented in three sub-themes: (a) facilitator support, (b) feedback on performance and (c) an adaptive approach to facilitation.

Facilitator Support

During my observations of the simulations, it was evident the level of support offered to the students varied depending on the facilitator. For example, one facilitator entered the room to assist if the students were not progressing, while others rarely went into the room and if they did, they played a role such as doctor. Some facilitators provided support by way of cue escalation. For instance, they might ask the person playing the patient to increase or exaggerate the patient's symptoms. In comparison, other facilitators seldom provided cues. In the mental health simulations, the facilitator paused the scenario mid-way to discuss the evolving situation and plan the next steps.

The students spoke about these different approaches in the interview. Rose said she appreciated receiving the "*odd hint every now and again*" because it helped her get "*back on track*." Heather believed the 'pause and discuss' approach was helpful because it reminded her of "*points to include and then go back in and practice those points*" and according to Riley, pausing and discussing the scenario gave her more confidence to continue. Rose and Heather also gave these examples:

> *We were a bit lost and then the facilitator came in and started to say, 'do this', in a house surgeon role… that's quite good because that is quite likely to happen in a situation like that. The doctor would come in and oversee what was going on and give us slight direction. So that was good. I found that really good* ***[Heather]***

> *They [the person playing the patient] feed off where we're going, what direction we're going in. I think it's helpful because sometimes you're not 100 percent sure if you're going on the right track but then they keep asking about it and then you start getting more information and then realise that it was a good way of heading in that direction … so they do make it slightly easier than it could be. I mean it could be a disaster if they didn't feed off, where we went and just had a set way of doing it* ***[Rose]***

These examples highlight the different ways a facilitator could provide support. However, common in most of these examples is the students appreciated receiving cues when they required assistance. These students' experiences are consistent with the construct of student support in the NLN/Jeffries simulation theory that identifies the use of timely and appropriate cues as a design characteristic (Jeffries, 2016). Although the facilitators observed in this study

tended to offer students some cues if they were not progressing, for most of the simulation they stayed in the control room. If they did enter, they usually left again quite quickly. Ginny mentioned this approach in the interview:

> *In simulation we called in the doctor, he did his bit and then left again. Would you leave the nurse alone to do that in clinical?*

In this example, Ginny refers to a simulation where the lecturer entered the simulation in the role of doctor. She makes a valid point about clinical practice, that is, if a patient's condition deteriorates, the nurse will call for assistance from the medical team who will provide the required support. Similarly, in clinical practice a nursing student is not expected to manage a seriously unwell patient by themselves. Instead, they will receive close support from a registered nurse. Riley and Brooke explained it like this:

> *In clinical you bring in extra help. You've got that support of people who are doctors, more experienced nurses. They are all there for support* ***[Brooke]***

> *[In clinical] you've always got someone to turn to that you know is an expert and that they can help you along the way* ***[Riley]***

As Riley and Brooke highlight, when the students are in the clinical setting they can ask for help from a team of experienced health professionals. However, for these students' simulations, the lecturer with the expertise was usually in another room. The student's primary source of support was their peer acting as a registered nurse. Riley and Mary gave these examples:

> *[In simulations] the person who is playing the RN role has no more knowledge than you and can't help you … so you've got to try and work together even though you both don't really know what you're doing sometimes* ***[Riley]***

> *In simulation you dread being the student because that's the one with the most work to do and you're looking at another student nurse that is acting as a registered nurse and that's quite difficult because they don't know what they're doing and you don't know what you're doing* ***[Mary]***

These examples suggest that Mary and Riley wanted more expert assistance in the simulation. This assistance was especially crucial when they were 'stuck' or as Bailey described "*hit the wall*." Riley and Andy explained it like this:

> *At some point maybe we can just stop and have a chat about things and get a plan sorted out and then go with it. It would feel much better* ***[Riley]***

> *It would be good if they [the facilitator] saw that you were coming to a point [and ask] 'are they really learning from this? Instead of them [the students] going in the wrong direction. Just walk in there and say 'where do you think we should go from here or what have you identified? … You could learn more by pause, hang on, where you want to go from here* ***[Andy]***

Riley and Andy's experience reflects the existing literature that students value interactions with experienced teachers during the simulation (Kelly, Hager, et al., 2014; Parker & Myrick, 2012). Kelly, Hager and Gallagher also found that students highly valued guidance from an experienced academic in the simulation and pointed out that academic support may range from no physical presence in the room to full engagement in the simulation scenario. The experiences of the students in my study also resonate with those of Crary (2012), who reported that students specifically wanted the facilitator involved in the scenario rather than standing behind the mirror. Likewise, Parker and Myrick (2012) found participants strongly preferred collaboration with experienced tutors who could bring contextual expertise.

However, other research findings differ. For example, Baptista, Pereira, and Martins (2016) reported that students appreciated not having the lecturer present because it gave them a greater sense of responsibility. These researchers also suggested that the absence of the teacher encourages students to develop skills in assessment, decision-making and teamwork. Similarly, Kelly, Forber, et al. (2014) argued that working autonomously in simulations may be advantageous because students can act as an RN and then reflect on the responsibility of their future role. Conversely, Harder et al. (2013) put forward that students should not play roles outside their abilities as they may not know enough about the position. This contrasting view was evident in these two different examples from Ginny:

> *When I'm in simulation, I really enjoy being the registered nurse because I feel more confident, like I know what I'm doing. I don't feel like I should take*

> *the backseat role … When you're expected to be a registered nurse or a doctor and you don't know anything about those roles … it can be quite challenging at times*

Ginny's example indicates she preferred the RN role in simulation because she could use her initiative. On the other hand, she said not knowing what to do in these roles was challenging. Ginny's experience shows that providing students with the right level of support is complex, which was also evident in Bailey's example:

> *I think if the facilitator gives us too much, then we might start relying on her and then you become too comfortable with that. So as much as it's uncomfortable, I felt really uncomfortable actually, but I think if she threw a line out and gave us something to hold on to, then we might have got too attached to that. So it depends how we're going. Maybe some snippet of guidance sometimes if we weren't making any ground, to help us learn … Like, if you have really hit the wall, maybe having some discussion, maybe prompting us to think in a certain way without telling us the answer*

For Bailey, the right level of support involved some autonomy, despite feeling uncomfortable, and also guidance when she could not progress. Supporting students this way requires the facilitator to be tuned to the needs of the students and respond when needed. Kelly, Hager, et al. (2014) made a similar recommendation suggesting the academic should tailor the guidance according to how the students engage and respond. Likewise, Groom et al. (2014) put forward that the support offered to the student needs to address the level of the learner. Harder (2012) identified the facilitator needs to decide when to provide cues and when to let the students continue without their help. This approach to facilitation aligns with Vygotsky's (1978) social learning theory, which posits that learning occurs in the zone of proximal development (ZPD). The ZPD is the difference between what a learner can achieve independently, and what they can do under the guidance or in collaboration with more experienced peers. Vygotsky proposed that a person can only imitate that which is within their development level. In line with this theory, to reduce the potential for students to become overwhelmed in simulation, the facilitator needs to be tuned to the needs of the student group and scaffold the level of support accordingly (Parker & Myrick, 2012).

Many simulation programmes do situate a staff member in the room with the participants. This person may be referred to as a confederate, embedded participant, or scenario role-player (Meakim et al., 2013). The usual role of the confederate is to guide the scenario and assist if the participants are unfamiliar with the equipment or environment. The confederate may play a role such as a healthcare clinician and is usually overseen by the hidden simulation director who is responding via a microphone and headpiece. If resourcing permits, this approach is a practical way to offer students more support. However, for the support to be adequate, the need for expert assistance must be reflected in the aim of the confederate/embedded participant role.

Feedback on Performance

In addition to wanting more lecturer support, the students also talked about their experiences of receiving feedback on their performance. A commonality in the students' experiences was they wanted a positive approach to feedback. If feedback was not framed positively, it could be quite upsetting for the student. Ginny and Mary gave these examples:

> *There's only been one or two that have been like, 'you didn't do this very well' and really focused on that which is quite upsetting. You go away and you're like, 'oh, I'm not going to make a great nurse.' Most of them have been really good and they tell you different ways that you could have approached it* ***[Ginny]***

> *I take a lot away from them. I think it is good to go over and see what you could have done better but a lot of the time, that's all it is. It is all about the things you did wrong. It's never what you did right … I wouldn't say all of them are… The lecturers are really supportive and they say it is a learning experience, it's not a pass or fail but you do go away thinking you could have done so much more. It's a bit frustrating sometimes* ***[Mary]***

As these examples show, Ginny and Mary wanted the feedback on their performance to focus on how they could improve, rather than what they did not do well. The students also described other helpful approaches to feedback. For Heather, it was not being made to feel as though, "*she had done terribly*." Rose said it was not being made to "*feel bad*" if there was something she should have known. Jill appreciated it when she received "*positive feedback about what went well and what didn't go well*." Mary wanted the "*good points*" highlighted and Ginny said

it was "*nice to know that they have noticed, looked at the positives and, not so much the negatives*."

Based on these students' experiences, feedback was most helpful when it was framed positively with a focus on how they could apply their learning to future practice. This approach to feedback is important because students often focus on the negative aspects of their performance, which was evident in the following examples:

> *I think I know what I've done wrong before I go in there so it's never really news to me when they say that I didn't do something because I've generally thought about it* ***[Mary]***
>
> *Most of the time we know when we have done something silly or mucked up somewhere* ***[Rose]***
>
> *It all comes out when we first walk out of the room … We are walking to the debriefing room and we all look at each other and someone might make a wee comment. Someone might sigh or someone might go, 'oh wow, bad'* ***[Jill]***
>
> *You can walk into debrief feeling low on confidence and thinking that was really terrible and why did I do this, why did I do that. Then once you start talking, sometimes it will get explained properly to you and you can make more sense of it* ***[Paris]***

Paris's example suggests that if the facilitator assists the students to make sense of their actions, this may help them put a feeling of failure into perspective. Other researchers suggest that feedback in the debriefing session is most helpful when it is appropriate and definitive to a specific action (Lasater, 2007b) and balanced with the inclusion of both positive and negative aspects (Cant & Cooper, 2011). Further, Neill and Wotton (2011) argue that a positive, confident, caring demeanour is essential to facilitate a successful, safe debriefing session and (Cantrell, 2008) points out that an unsupportive approach can have an adverse effect on learning. The findings in my study suggest a positive and constructive approach to feedback is particularly important in simulation because, as discussed earlier in the chapter, students are often highly anxious due to the pressure to perform and the evaluative uncertainty associated with the practice of hidden observation.

An Adaptive Approach to Facilitation

Another finding related to facilitation, was the potential of simulations to induce an emotional response and that the student may not necessarily talk about this in the debriefing session. This conclusion was based on Bailey's experience in a mental health simulation that involved a patient at risk of self-harm. Bailey explained her response to the simulation like this:

> *I found in the mental health sim, it was quite heavy, so I was quite taken aback by all of that and then try and do the sim as well. I was probably a little bit more sensitive to the feedback we had with mental health but it probably depends on which simulation it is for each student*

To prepare for this simulation, the students completed an online self-learning package about risk-assessment for a patient presenting with potential self-harm. Bailey had also spent three weeks in a mental health setting working alongside an RN the previous year. However, Bailey found this simulation personally challenging despite this preparation and exposure to patients in the mental health setting. Bailey also believed this particular simulation could be challenging for other students. She explained it like this:

> *They [students] could have had a family member that just had the situation that you're walking into … that just adds another dimension to how the student deals with the situation … I think often they [lecturer] can be rushed in that they don't really take into account the effect that delving into suicide and things like that, can really have on the student*

Bailey's example suggests some students might find a simulation confronting not because it is academically difficult, but because it raised an upsetting personal issue from their past. Her example also indicates she did not feel there was enough time in the debriefing session to discuss how she really felt. Although Bailey did not elaborate as to whether her experiences of self-harm were personal, when asked if she talked about her feelings during the debriefing session, she replied:

> *You are worried about how the teacher is perceiving you and how you are performing … You just don't know whether to open that whole can of fish. You don't want it to take away from the other students learning and also it just opens up a whole, big, another topic. So you don't know if there is the*

> *time or if it's the right time or even if you feel comfortable talking to the teacher about it. … The feeling I have gotten from other students is they find debriefing helpful, but they are itching to carry on with their day*

A number of reasons may explain why students may be reluctant to discuss their feelings in the debriefing session. For example, students could worry that discussing a personal response may distract from the purpose of the simulation or that it might delay their peers. Students may also fear how their response will be perceived, which may be exacerbated if there is a potential stigma associated with the response (for instance mental health). There is also power inequity in the teacher/student relationship, which may deter students from discussing their feelings. Paris alluded to the lecturer/student relationship in the following example:

> *It's more supportive in clinical, everyone is on the same level. It's not this is what you've done and you need to do this and you need to do that. When you are in simulation debrief, you've got two different levels. Like there's the lecturer and then there is you, so it's not as equal*

Arguably, nursing students also face stressful situations in clinical practice and without doubt, these students will encounter challenging situations in their future nursing practice. Moreover, learning how to manage powerful emotions is a crucial aspect of becoming a nurse (Benner et al., 2009b). One could thus argue that exposing nursing students to emotionally challenging situations in simulation, will better prepare them for clinical practice. This argument has merit; however, after an emotional or challenging incident in the clinical setting, there may be more time for reflection or debriefing, particularly if the students are in the clinical environment for an extended period. Students may also be debriefed by a member in the healthcare team and this could feel less threatening than discussing their feelings with a lecturer. Further, as discussed earlier in this chapter, learning in simulation can be stressful. Adding an emotional response or outside stressor to the pressure to perform in simulation may potentially overwhelm students. Jill's example highlights this:

> *I knew why she [another student] was upset and it wasn't because of simulation. It was an outside reason, so she just felt overwhelmed. But I felt for her, because if I'd been in the same situation that she went through. It's not nice, but it makes everything harder … I think it [simulation] is a good thing to be doing, but a lot of pressure on you, lot of pressure to do well*

There is limited discussion in the simulation literature about the effect of an emotional response in simulation (Janzen et al., 2016). However, Gaba (2013) has proposed some strategies to manage potentially distressing content in simulations. These include considering participant vulnerability when designing and conducting the simulation, disclosing any psychologically challenging aspects of the scenario during the briefing, and ensuring the facilitator has experience and is trained to deal with any emotional issues that may arise. Gaba also recommends follow up and referrals to other professionals if there is any indication of psychological distress.

Although Gaba's (2013) suggestions are helpful, it is not always possible to predict the response of the student because they bring personal experiences to the simulation that the facilitator may not be aware of. Therefore, the facilitator requires skill in reading situations and should also prepare for an unexpected response in all simulations. An ability to tune in to the students and where they are at, is particularly important during the debriefing session.

There are several recommendations in the simulation literature about how to facilitate a debriefing session. These include ensuring debriefing is student-centred (Mariani et al., 2013), and scheduling it straight after simulation (Nickerson et al., 2011). Sabei and Lasater (2016) and Wever (2015) recommend using a structured debriefing guide and, Eppich & Cheng, (2015) encourage educators to use a blended approach to tailor the discussion in debriefing according to the needs of the learner. Although structured debriefing guides are helpful, Bailey's experience suggests frameworks should be used with flexibility and the facilitation approach adapted according to the individual response of the students. An adaptive approach could mean moving away from the learning objectives, which can be somewhat challenging if the objectives are examinable. Yet, using an unexpected response or unintended outcome as a learning moment is an excellent educational opportunity to provide meaningful learning in preparation for the complexities of real patient care. This finding is consistent with the argument of Kelly and Guinea (2018) that as a facilitator, flexibility to respond to the individual needs of the students is key. Likewise, Cheng et al. (2016) recommend that due to the unpredictable nature of debriefing, facilitators need to be educated on the common pitfalls, associated consequences, and potential solutions when leading a debriefing.

CONCLUSION

This chapter explored students' experiences of facilitation in simulation. It focused on how the facilitation of the simulation could both enhance and deter the process of learning. The findings suggest that while lecturer observation is an important facilitation strategy, for some students, this was detrimental to their learning, and ultimately the development of clinical judgement skills. For example, some students experienced significant anxiety in simulations because they felt a pressure to perform on the spot and without the assistance of an expert. Hiding the lecturer behind a one-way window seemed to exacerbate this anxiety because it had the potential to create evaluative uncertainty and feelings of judgement. Some students may also fear the consequence of making a mistake in simulation, particularly if at some stage during their degree, their competence may be assessed by the lecturer observing them. The student's response to lecturer observation may also depend on how comfortable they are with risk-taking, failure and their response to the lecturer's presence.

The findings also suggest novice students need more lecturer support in simulation, especially when they were unsure how to progress. Support from the lecturer was particularly important due to the stressful nature of the simulation environment. On the other hand, providing the right level of support is complex because simulations also offer students the opportunity to practise autonomously without fear of patient harm. The preferred approach to lecturer support for these students seemed to be a 'pause and discuss' approach or, using the patient to provide more cues.

Another finding in this research was the facilitator's approach to feedback on performance needs to focus on how the student could improve, rather than what they did not do well. This approach is important because students tend to focus on the negative aspects of their performance and are anxious due to the evaluative uncertainty associated with hidden observation. Bailey's experiences also suggest a student may not necessarily talk about an emotional response, therefore the facilitator may be unaware a student is upset.

There are implications of these findings for those who facilitate simulations, especially if the intended outcome is clinical judgement development in nursing students. First, educators need to consider how they can foster a simulation environment in which students feel comfortable to experiment with their ideas. A suggested approach is to scaffold the simulation experience and the presence of the lecturer according to the developmental stage of the students. For

example, in the early stages of the students' education, simulation could be more about play and as students have fun, they also learn something. Virtual gaming and opportunities to practice without a lecturer present are examples of this. Providing playful learning opportunities means the student establishes what they are learning and this may make the experience more significant. For this approach to be successful, educators need strategies in place to ensure students are learning correctly. As the students' progress through their education, simulation experiences could then be more serious and the emphasis could shift from play to the reality of clinical practice. The final chapter (chapter seven) revisits this idea.

The second implication is that in simulation, the support from the lecturer needs to be appropriate to the development stage of the students and cue provision tailored accordingly. The facilitator's approach in the debriefing session should also be flexible and adaptive to meet the individual needs of the student and feedback on the students' performance framed positively.

In closing, the nursing students in this research were at the development stage of an advanced beginner (Benner, 1984). Students at this stage still need guidance and interactions with an experienced teacher to grasp the nature of a situation and clinically reason. They also need coaching from an expert to recognise salient cues, interpret these, respond and reflect in action (Tanner, 2006). To support nursing students' development of clinical judgement skills in simulation, stationing the lecturer in the room with the students is recommended. As the students gain more knowledge and experience, the support of the lecturer could be gradually withdrawn to provide opportunities for independent practice without the risk of patient harm. Educators in undergraduate education are in the privileged position of being able to help students build on their theory, simulation, and clinical experiences over a period of at least three years. Therefore, the opportunity exists to consider how theory, simulation and clinical experience are integrated into the nursing curriculum to promote nursing students' development clinical judgement. This idea is further discussed in chapter seven.

The next chapter compares participants' experiences in simulation to their experiences in clinical practice. It is the third and final chapter to present the research findings. The aim of this next chapter is to explore how simulations can be effectively designed to support the development of clinical judgement in nursing students.

CHAPTER SIX: STUDENT EXPERIENCES IN THE SIMULATION AND CLINICAL ENVIRONMENT

The previous two chapters explored third-year nursing students' experiences in simulation. The key findings were that what the student brings to the simulation and the facilitation of the experience affect the students' learning in this environment. To enhance students' learning experiences in simulation, educators need to account for participant-related factors and the facilitation approach in the design and planning of simulations. This chapter compares third-year nursing students' experiences in simulation with their experiences in clinical practice. It draws on the students' clinical stories and data from the first and second interviews to discuss the clinical and simulation contexts as learning environments. The purpose of this chapter is to understand what these two contexts offer the student regarding clinical judgement development and, consequently, how we might use simulation more effectively.

Four themes in regard to the students' experiences in simulation and clinical practice were identified:

1) Knowing the patient
2) The messy reality of clinical practice
3) Feelings of responsibility
4) Experiencing critical incidents

The first theme, knowing the patient, highlights the effect of the simulation environment on the students' assessment of the patient and their ability to demonstrate relational care (defined by Spadoni, Doane, Sevean and Poole (2015) as the provision of respectful, collaborative and relationally-responsive patient care). The second theme, the messy reality of clinical practice, refers to the students' experiences of caring for patients in the clinical setting and the complexities of patient care. This clinical reality differed from their experiences in simulation, which were predictable and controlled. The essence of the third theme, feelings of responsibility, is that in the clinical environment, the students felt a strong sense of responsibility because their action or inaction affects a patient outcome. In simulation, this feeling could be less present and their response 'did not really matter.' The fourth theme, experiencing critical incidents, highlights the students' experiences in the cardiac and respiratory arrest simulation and the influence of these on their clinical practice.

The findings in each of these four themes are important to consider if the intended outcome of the simulation is clinical judgement development because they influenced what the student noticed in the simulation, their response, and reflection on their actions, all of which are critical dimensions in the process of making a clinical judgement (Tanner, 2006).

KNOWING THE PATIENT

The students provided many stories about developing interpersonal relationships with their patients in the clinical environment. These stories highlighted that the students' responses to their patients were influenced by knowing the patient which was the result of being in relationship with the patient over time. For example, Jill shared a story of feeling upset because her patient she had cared for over three days was in severe pain with severe muscle spasms. Bailey talked about feeling sorry for one of her patients who was feeling sick because she had experienced nausea herself. Andy shared his feelings about caring for a patient with depression:

> *I was humbled by his wife who was very supportive and had been managing him alone and had also taken a week off work to care for him. I couldn't imagine being in her position and coping as well as she was.*

Jill also shared a story about caring for a patient from admission through to discharge. The following are excerpts from this story:

> *I felt very comfortable caring for Mrs K on the ward because I was able to follow her right through so I knew everything about her health history and what medications she had … I had followed Mrs K right though admission to recovery so it was appropriate that I cared for her as I knew the most about Mrs K … By following this patient right through I was really able to gather a sense of where the patient had been before I see them on the ward … I was able to gather knowledge on many assessments implemented on the patient … I think it has helped me to have a more holistic view on nursing to think about what else is going on for the patient not just in your one setting*

Jill's story illustrates that because she cared for Mrs K at different stages of the inpatient journey, she understood her patient's unique needs, which gave her a more complete picture. This story from Jill exemplifies what Tanner (2006) describes in her clinical judgement model, as personal knowledge of the patient. According to Tanner, this personal knowledge comes

from being in relation with the patient. This knowledge aids the nurse's assessment because they come to understand the patient's physical capabilities, usual responses to therapeutic measures and how the patient and their family experience their illness. This knowledge enhances the clinical judgement process, because aspects of the situation stand out and the nurse can compare the current situation to how the patient typically presents.

In comparison, in simulation, the participants cared for the patient over a timeframe of 20-30 minutes. For Ginny and Bailey, this meant the simulated scenario only provided a 'snippet' of the picture:

> *[In clinical], it is good to have that time because then you can really understand the full picture of what you may have witnessed instead of a snippet of the whole picture* ***[Bailey]***

> *[In simulation] they give you the paper and you read it through but you don't know anything about them, it's just what you've got … On the wards you're going in and you're reading their notes and then you're getting to know them and you're asking them questions while you're looking after them. It paints more of a picture* ***[Ginny]***

The participants were given background information about the simulated patient during the simulation briefing. This verbal information typically included the patient's age, gender, reason for admission, relevant social and medical history, and current clinical status. The scenario also included concerns such as fear or anxiety and information about family members. Although Ginny and Bailey had this background information, their examples above indicate this information did not provide a complete picture of the patient because the story was taken out of the context of the whole.

The year prior to this study, the nursing school where this study was conducted, undertook a research project that combined physiological experiences, video cases of real patients and simulation (Ditzel, Hogarth, & Lesa, 2017). One of the project aims was to provide a more complete picture of the simulated patient. As part of this project, the nursing students watched a video of a patient and his wife, talking about their experiences of the husband's myocardial infarction. The students then participated in a simulation based on this patient's story. Both Andy and Ginny referred to this project in the interview:

> *I enjoyed the lab tutor [immersive approach]. To follow that one client through and to see them and actually being able to treat that client in simulation and coming back to that tutor and reflecting what you did. Getting that really good background knowledge* ***[Andy]***

> *I found that simulation [immersive approach], really enjoyable because you knew a bit about him, where he lived, what his situation was … it gave a sense of a wholeness and more aspects of the person's life that you can look at and figure out* ***[Ginny]***

These examples from Ginny and Andy support the findings of the research project that the students appreciated the addition of a real patient story to the simulation experience (Ditzel et al., 2017). This is not surprising, because nurses gather social, emotional, and psychological information to gain a holistic view of the patient (Bickley & Szilagyi, 2016). This holistic view is important because it enables the nurse to assess, identify particular patient concerns and provide care. A complete picture of the patient is crucial in the process of making a clinical judgement because what the nurse notices, sets the scene for reasoning and responding (Tanner, 2006). However, according to Ginny, in simulation, the patient picture was incomplete and this affected her clinical reasoning. She explained it like this:

> *I have so much in my head that it could be and I'm trying to eliminate them, with what you're seeing but sometimes you're not seeing the whole picture with the manikin, it's just a doll*

The importance of providing a holistic picture of the simulated patient is well recognised and various approaches are described in the literature. For example, McAllister, Reid-Searl and Davis (2013) created Mask-Ed ™ (an educator hidden behind a silicone mask) to add realism into role-plays. Frost, Foster, and Ranse (2017) used Mask-Ed ™ to implement unfolding case studies to help students gain an understanding of the psychosocial care for people with chronic illness. Reid-Searl et al. (2014) incorporated puppets to bring life-history to a simulation to help students interact with children. Strategies such as these are worth considering, particularly if the intended outcome of the simulation is clinical judgement development because to make a judgement, the nurse requires a complete picture of the patient.

While simulations can be designed to encourage students to assess holistically, for some students, providing relational care to the simulated patient was more difficult because the interactions in the simulation were not real. Nonetheless, the students were expected to demonstrate relational care in their simulations by introducing themselves, responding in a caring way and concluding the relationship appropriately. However, for some students, using a simulator to play the patient made it challenging to demonstrate relational care because the interactions were one-way and the patient was not real. For example, Brooke said "*interpreting the person speaking over the microphone*" did not "*work*" for her. She also said she preferred "*being human to human and having that experience*." Paris explained that in clinical, "*it's a real person, you're actually there, you're talking to them and you can get a real sense*" and according to Ginny, "*the patient says she feels sick and they look like a dummy*." Ashley explained:

> *I think for me, when I'm on clinical, the first step is building up that therapeutic relationship so it's not so awkward. I know they've got the voice in the simulation it's really not the same, there's no body language … I knew that I should've been talking to her to check her response and stuff but I just feel like an egg, talking to a dummy*

By comparison, a range of emotions were evident in the students' clinical stories. For example, Mary said she was "*quite pleased*" that she managed to have a relationship with a "*difficult*" patient. Jill said she felt "*really good*" when a patient told her she would make a "*good nurse*". Andy shared a clinical story about a patient he visited in the community:

> *I also felt nervous to meet her again as I was unsure if she recognised me, how she would react. In the same respect I was also excited to see how well she was doing as I had no follow up with her since finishing my placement last year. The client opened the door and when she saw me her eyes lit up and she remembered my name, gave me a hug and asked how I was doing. I was astounded she not only remembered me but remembered my name as well*

In this example, Andy talked about feeling nervous, excited and then astounded that the patient remembered him. Students may also experience feelings of satisfaction when the simulation goes well. However, experiencing an authentic response of gratitude is different from a scripted response in the simulation. If an authentic response is lacking, students may find it difficult to

gauge whether they are establishing successful interpersonal relationships. For example, Jill said the patient's response helped her decide if she was gaining their trust:

> *I quickly gained a therapeutic relationship with Mrs K and her family by talking to her about her family and I knew I had gained her trust by the way she was so thankful for all the cares I was able to do for her*

As these students examples illustrate, nursing care is interpersonal and relational. Therefore, students' must learn to establish therapeutic relationships with many different people and as Keegan experienced, despite her best efforts, not all patients will like her:

> *He [the patient] obviously wasn't happy having a student … that threw me a bit … It was making me quite restless … I was struggling to concentrate … She [the preceptor] was like, 'what are you worried about? You know, this is going to happen, people are not going to be nice to you all the time, don't even think about it… don't worry … later on, he said, sarcastically to his visitor, 'I've got students, lucky me' and that I think was my lowest*

Although Keegan found this experience challenging, uncooperative or difficult patients are part of the nurse's clinical reality and students must learn how to respond in these situations. In contrast to Keegan's clinical experience, Jill perceived that because the simulation was only 30 minutes, the lecturer will "*make the dummy like you, so you can go on to your assessments*." She explained it like this:

> *You might ask a dummy a question, 'so how are things going?' and a person might go, 'just horrible and I don't want to talk to you' a dummy will go 'yes, lovely, thank you'. [In simulations] I ask one question and if they don't respond well, you ask another one. If they don't respond well you ask another one and they do [respond] because they want you to get the information, but a person's not going to do that. If they're grumpy, they're grumpy*

This example from Jill indicates she viewed simulations as predictable because the end point usually involved resolution. In contrast, the students' interpersonal relationships in clinical practice were not necessarily straightforward. Jill's simulation experience is relatively easy to change because educators have the ability to incorporate a range of interpersonal relationships into the simulation programme. For example, in the beginning years, simulations could be

straightforward and, as students' progress through their education, educators could introduce unpredictable and challenging interpersonal relationships into the simulation.

In summary, educators need to continue to explore innovative strategies to provide a complete picture of the patient. A complete picture is particularly important if the intended outcome of the simulation is clinical judgement development because the patient picture provides the cues to begin the process of making a judgement. Educators also need to acknowledge the influence of using a simulator and caring for a patient in a snippet of time on the provision of relational care in simulation. These limitations should also be considered when planning where simulation can best be used in the nursing curriculum to develop students' clinical judgement. Curricular integration is discussed in the final chapter of this thesis (chapter seven).

THE MESSY REALITY OF CLINICAL PRACTICE

During each clinical practicum, the participants were required to write two reflections and include these in their portfolio. Several of the clinical stories the students provided for this research were from this portfolio. These reflective stories provided many examples of the complexity of clinical practice, which illustrated the 'messy reality of clinical practice'. For example, Bailey talked about a situation where the mental health team received two separate phone calls from a wife and husband and each raised concerns about the other and the nurse had to decide which story to believe. Andy gave an example of systemic failures that made it difficult to manage a deteriorating patient. Keegan shared a story about a busy shift and the impact of understaffing on patient safety. Jill talked about a situation where she needed to advocate for a patient in pain.

Also evident in these clinical stories, was that these 'messy realities' provided valuable learning moments. For example, Mary observed a patient being restrained and said, initially, she was "*against seclusion*" but came to understand that, to ensure the patient's and nurse's safety, restraint may be necessary. When Ginny was treated rudely by a team member, she reflected on team-work and its influence on safety in healthcare. When a patient Riley was caring for escalated into a psychotic event, she questioned if this could have been prevented because two hours before the incident, the patient was exhibiting signs of increasing agitation. In Bailey's mental health reflection, she said she learnt about "*setting limits and defining boundaries*" and being "*open minded*."

The following example presents excerpts from a clinical story from Paris about her encounter with a baby admitted with non-accidental injuries:

> *It was quite shocking and upsetting to see …this baby was just really a zombie, just lying there, some movement but with broken limbs and brain injury. So it was just very upsetting … It was hard, you know, coming across a baby that had been hurt … I guess what I learnt was to talk about it and try and make sense of it I guess, not that I made sense of it because I don't think you ever could… this is something that actually happens and we just have to do the best we can because no one else in the baby's life has, so yeah just do what you can … I remember one of the charge nurses saying that you just have to look at it as, this is not your child, you haven't done this. It's something that someone else has done that's out of your control. I thought it was quite a harsh thing to say but it kind of made sense*

As this story from Paris illustrates, situations such as this are incredibly upsetting and how one responds is difficult to predict. The following is an excerpt from her reflection on this incident:

> *I need to learn to not take these emotions on and, at the same time, be able to empathise with the client and show my understanding and possibly help them. It is important for me to practise self-care in order to be able to maintain and conclude therapeutic relationships with patients*

For Paris, reflecting on this immensely sad situation helped her understand her personal response to a distressing situation and, with the support of those around her, she learnt how to care without over-identifying with the patient. Ginny shared a similar experience:

> *I went to a course … on [placement] … It was for mothers who had experienced stillborn, miscarriages and how that's affected them and their subsequent children. It was really interesting for me because my Mum lost a stillborn baby before me and after that we had all these attachment issues … It was quite a big impacting thing …*

Ginny continued on to explain that she found reflecting on these types of situations helpful:

> *I find writing reflections on placement is a good chance to develop yourself, and understand yourself … I think reflections are more for me than the lecturer*

Ginny's example resonates with that of Tanner (2006) that reflection on action usually has a trigger point, for example, encountering a difficult or complex situation, experiencing a strong emotional response, or making a good or bad judgement call. Tanner puts forward that the knowledge gained from this reflection contributes to the nurse's future clinical judgements.

The students also reflected on their actions in the simulation during the debriefing session. However, both Ginny and Ashley said their reflection after the simulation differed from their reflection in clinical practice:

> *In clinical, you don't reflect on what you could've done … I mean sometimes you do. It's more what happened and how do you feel about it. It's not so black and white, you did this right, and you did this wrong … When you write a reflection for simulation, you're talking about what happened in your role but on placement I talk about my feelings and how this affected me and how I think it might've affected the patient. It's a lot more feelings and emotions to it.* ***[Ginny]***

> *I like the debriefing in simulation because you go over what you've missed out and what you did really well. I think it's good to know that because you can fill in the gaps of your learning. It also reinforces what you're doing right, what to continue doing and what you need to change … that one [reflection] in clinical, I did straight away because I was feeling so much emotion. It was really good for me. It helped to relieve some of the anxiety and stress around what was happening and get an understanding for what I was feeling. But it's a different type of reflection because it's more on a personal experience like on your emotional side of the experience rather than your practical experience, if that makes sense?* ***[Ashley]***

These examples suggest that for Ginny and Ashley, their debriefing session after the simulation tended to be feedback-focused, whereas their reflection in the clinical environment was driven by intense feelings and a need to understand their emotional response. Understanding what

drives the student's reflection in the two environments warrants further investigation because these students' experiences indicate that reflection after simulation may be externally driven by learning outcomes, whereas feelings are at the forefront of reflection in clinical practice. Accordingly, reflection in simulation may be teacher-driven as opposed to being student-driven in the clinical environment. While reflection on their performance in the debriefing session offers student feedback to develop competence, students also need to reflect on situations that are not clear-cut, or are uncomfortable, because these situations teach students about themselves and their personal responses (Benner et al., 2010a). The following example comprises excerpts from one of Ashley's clinical stories. Her story stood out because it illustrates the high-stakes nature of clinical learning.

> *One of my experiences I'll never, ever forget. I got to experience what it's like to be well and truly afraid … The consultant, my preceptor and I went to a community visit… It was going really well until they were talking about his use of substances, and my patient told the clinician that he hadn't been using anything for the last month or so. My preceptor was like, 'hold on a minute, you told me last week the reason you were angry was because you were on glue'. He didn't like that … I was holding his depot medication in the depot bag and my shoulders lurched forward uncontrollably … I didn't have control of my shoulders whatsoever. It was the strangest feeling because he was yelling and you know, he's big, he's tall, and he's dangerous. He's up on assault charges and everything. Luckily he stormed out. He was saying, I'm going to kill you, get out, get out now … I didn't want to walk past him … I looked at the consultant and at my preceptor and I must have had fear written all over my face and my preceptor said, 'it's okay, it's okay' … but I still didn't feel safe … My preceptor was like, 'it's okay, I'll be right behind you' … After I got out the door and I breathed, I could feel myself tense, completely tensing up and like I was going to burst into tears … My shoulders were all fizzy and had this real weird sensation running through them. We got back to the office and my preceptor said 'we're going to need to talk about this'. I was like, I know and started crying and then I got embarrassed which made me cry even more, which is stupid*

The incident Ashley experienced is high-stakes reality (Benner et al., 2009a) and it is situations like this that educators prefer to avoid. What if Ashley had been hurt? What if she decided to leave nursing because of this incident? It was certainly not an ideal situation for any of the staff involved. Fortunately, Ashley was able to debrief with her preceptor and the social worker. The following are excerpts from her reflection:

> *I learnt the importance of knowing your exits, making sure that you're assessing in appropriate places. It made me question the safety of outreach staff in those situations … He snapped, there was no build up and even the consultant said that. It was just 'boom' and it wasn't like a slow increase of agitation either. It was full on aggression right there and then … I learnt a lot about myself… know what it's like to have adrenaline rush through your body and not be able to do anything with it. I think that's what most of the feeling in my shoulders was, shock, because that lasted until after I was home … My preceptor said 'if I said to you, we're going to go see this patient, what you would do?' I said I'd probably tell you, I don't want to come, but I would come, because in the real world, I wouldn't have a choice*

Two aspects of Ashley's reflection stand out. First, situations like this, although frightening, yield rich learning opportunities for students. However, adequate support must be in place. Second, Ashley recognised this was the 'real world' and she had no choice but to respond and her reaction taught her about her personal response to adrenaline. Interestingly, prior to this clinical incident, Ashley participated in a simulation where a patient experiencing hallucinations had scissors. I asked her if there were similarities in her simulation and clinical experience. She replied:

> *No, because you know you were safe in that situation. You knew that you weren't actually going to get hurt in the simulation because you know that person isn't in an actual state of psychosis and you don't feel those feelings of adrenaline. You don't have any of that at all … I think with simulation, you learn to know where your exits are … I do remember talking the patient down and taking the scissors … but she wasn't aggressive. It was all self-risk, it wasn't risk to us*

Ashley's example illustrates that although her simulation and clinical experience differed, both situations taught her about managing a psychotic patient. For example, in the simulation she learnt that to keep herself safe she needed to know where the exits were. In the clinical situation, she was able to use this knowledge to keep herself safe. This finding indicates that while both learning contexts contribute to clinical judgement development, the learning is different. Therefore, integration of the two different experiences in a timely way into the nursing curriculum is crucial.

Educators are unlikely to simulate emotionally distressing or risky incidents because this negates the purpose of risk-free learning. However, in the clinical reality, students experience potentially harmful situations, end up in uncomfortable situations and feel a range of emotions. For example, in the clinical stories, participants used words such as distressed, upset, rewarding, surprised, overwhelmed, panicked, uncomfortable, immense sadness, excited, 'sorry for the patient,' emotional, confident, relieved, curious, astounded, nervous, and afraid to describe their response in clinical situations. Students also have to work with various personalities and hierarchies in the inter-professional team. For instance, Ginny shared a story about an encounter with another healthcare professional that was quite upsetting. She said although the experience helped her learn about team dynamics in healthcare, at the time she was quite distressed. When asked if this team-member interaction could be simulated, she replied:

> *No. Oh you could, but it would probably make the girls cry. Like I talked to a couple of the other student nurses and they were like, 'oh that's really awful, if it was me I would have stood in the corner and cried.' I was pretty close but I held it together*

Participating in simulations to learn about teamwork is very common (Bogossian et al., 2014; Tofil et al., 2014). However, because the simulation experience is designed and controlled to meet learning objectives, it is unlikely to evoke the feelings Ginny described. Yet as these students' stories illustrate, these experiences are the messy reality of clinical practice and students must learn to manage their emotional response. Moreover, it is these uncomfortable situations that provide a platform for self-reflection and personal growth as a nurse (Benner et al, 2009a). This is particularly so when students are given a chance to reflect on these

experiences with the support of a caring practitioner or educator who can coach and guide the student through the accompanying emotions.

FEELINGS OF RESPONSIBILITY

Based on the findings presented in the previous theme, it is perhaps not surprising that the students perceived learning in simulation as low-stakes in terms of patient risk. For example, Ginny said if she "*stuffs up … nobody goes home dead*," and Andy said he valued simulations because the "*consequences were only for learning*." However, because their actions in simulation did not affect a patient outcome, for some students, there was a feeling that in simulations, 'it does not really matter.' In contrast, when the students cared for patients in the clinical environment, they felt responsible for the patient outcome, and this influenced their response. This feeling was evident in Keegan's clinical story about caring for a patient who became increasingly sedated after surgery. The following are excerpts from this story:

> *The other scary thing about that is that if I'd been on my own, I'd be like 'oh she is fine' then come back half an hour later and she could have been dead because I'd missed something that simple. So, I think that was probably a bit of a wake- up call … This scenario made me really realise the huge importance of maintaining an effective airway, and how much responsibility the nurse has over the post-operative patient's life*

Likewise, Ginny shared a story about feeling accountable for the patient:

> *The nurse had gone home early and I was with a boy who she said was suicidal. I was documenting his notes after she left and I was like I need to find somebody else to read this to make sure that what I've done is correct … I asked [the nurse] 'what I've said in here and done for this patient is that what you would've done?' She said yes so that was really reassuring. But yeah, you're responsible for someone's life in clinical. In simulation, you can kill someone and the worst you're going to get is, 'you shouldn't have done that'*

These stories illustrate the feelings of responsibility that accompany patient care, which several students said was absent in simulation. For example, Ashley explained that in simulation "*it did not really matter*" because the patient was a "*dummy*." She also commented that "*what you*

don't know, you make it up … but you don't do that in clinical." According to Keegan, "*if the patient falls out of bed, it's a manikin, nothing is going to go wrong*," whereas in clinical, "*it is an actual person*." Riley said, "*the expectation in simulation, is that you tried, but you don't have to. It would be awful if you did not do it right on clinical*." Brooke gave this example:

> *It's almost like you don't have as much responsibility in a sim. When you're out in practice, you are a student nurse who is independent … you really have to make sure you're doing the best that you can at that time. Whereas in simulation, I feel like you have this thing in the back of your mind that whatever happens, happens. It's almost like some of the responsibility's taken away*

These examples indicate the students' simulation and clinical experiences differed because in simulation, their actions did not affect a patient outcome. This difference also seemed to affect the students' responses in the two environments. For example, Mary and Ashley were not overly concerned about a potentially life-threatening mistake in the simulation:

> *I knew I was holding it [the resuscitation bag] wrong but I just thought, oh well … because I think I knew that it wasn't going to actually die on me because it's not real. In a real situation, I think I would be like am I doing this correctly and ask someone to help me with this bag* ***[Ashley]***

> *I remember looking at the medication and I thought, that's not Naloxone … I just went with it and then when someone mentioned that it [the naloxone] was in the trolley, I clicked and I thought of course it's in the trolley* ***[Mary]***

When Mary was asked if she alerted her peer that it was the wrong medication, she replied:

> *No, I was trusting what she was doing but yeah I probably could have said something*

The response these two students describe is likely to be quite different from their response in clinical practice for two reasons. First, Ashley did not try and correct her technique during the resuscitation, and second, Mary did not speak up when her peer was about to make a major drug error. By comparison, in the clinical environment, the feeling of responsibility for the

patient outcome would probably encourage Ashley to correct her technique and motivate Mary to warn her peer that she had Heparin instead of Naloxone.

A different response in the two environments was also evident when Riley said that in simulation, she did not "*actually care if she stuffed it up*." In her clinical story she wrote:

> *All of a sudden she [the patient] shot backwards on me and absolutely luckily, my heart was absolutely racing, she landed half on the bed. She could have fallen forward on to the floor so easily and it would've been bad news … so I rung the bell to get help. In the meantime we [the patient and her] just had to get our breath back because we were both puffing and panting a bit and just shocked … no one came to respond to the bell so we managed to get her up on the bed and sat there for a bit talking about the situation and how she really needed to slow down and not rush into trying to get to where she needed to be*

In the follow-up interview, Riley was asked how she felt during this incident, she replied:

> *Like it was my fault … I wasn't in the right position, I should've been behind her but we were all doing the same thing, it wasn't just me, we trusted her*

Incidents like Riley described, are commonplace in clinical practice because the patient's response is unpredictable (Benner et al., 2009a). Riley also had the unfortunate experience of not receiving help when she rang the bell. On the other hand, this experience quickly taught Riley to stay behind the patient when mobilising her. Although situations like this are not ideal, in the current healthcare environment they are too often the reality. Therefore, preparing students to manage the unpredictability of clinical practice is paramount and simulations could be designed specifically for this purpose.

These students' experiences are worth considering for two reasons. First, because the patient outcome in simulation is not real, educators cannot assume the students' response in simulation and clinical practice will be the same. Educators could acknowledge and discuss this potential with the students in the debriefing session. The potential for a different response also needs to be accounted for if the educator is grading the student's actions in a simulation. Second, a feeling in simulation that 'it does not really matter' may influence the students' clinical judgements because to reflect on their actions, they need to respond authentically. Barab and

Duffy (2000) raised a similar point in their discussions about practice fields. They argued that to meet outcomes in created learning environments, learners need to assume ownership for the dilemma and resolution. Immersion in the simulation might potentially help students feel accountable for the patient outcome, because in this state, the students may be more likely to respond as they would in clinical practice (see chapter four). To some extent, Ashley's example below illustrates this idea because although she knew the outcome of the simulation was not real, she still felt a sense of panic:

> *You don't have that drive I guess because you know at the end of the day, nothing wrong can happen in the simulation … it's a dummy, it's not actually going to die, no one's going to get hurt from this… [In simulation] I started panicking a little bit because of all the bells and so I had a moment of panic because it's like, this is happening now*

Feeling panicked in a life-threatening clinical situation is understandable because the patient outcome is real, but why Ashley was panicked in the simulation is less clear. It may have been the sound of the alarms, anxiety related to a pressure to respond, or she may have experienced a moment of immersion and feared her simulated patient would die. Understanding what drives the students' feelings in simulation is important, because it may assist educators put strategies in place to induce an authentic response. For example, if Ashley's sense of panic was a moment of immersion, capturing and sustaining these moments may lessen the feeling that in simulation, 'it does not matter.' If the sense of panic was more about the anxiety induced by the simulation, this suggests educational strategies are required to decrease anxiety and increase the likelihood of an authentic response (chapter five).

EXPERIENCING THE CRITICAL INCIDENTS

The essence of this theme is learning how to manage a critical incident (life-threatening situation) is important preparation for clinical practice. On the other hand, if critical incidents are over-represented in the simulation programme, students may experience disconnect between their simulation experiences and the clinical reality.

These students participated in 15 simulations during their nursing degree. Seven of these simulations involved a critical incident. Two simulations required the students to resuscitate the patient. One was a scenario about a patient with chest pain who went into cardiac arrest and the other involved a patient going into respiratory arrest after administration of narcotics. All

12 students spoke about these two simulations and were unanimous that both were valuable preparation for clinical practice. Rose gave this example:

> *The majority of us have never had to witness someone going through an arrest whether it's a cardiac or respiratory resuscitation. So I think it's quite good that we've had this experience now before we become an RN and then jump in the deep end when it does happen*

As Rose explained, students may not get a chance to practice critical incidents in the clinical environment because a novice learner may pose a risk to a patient. Further, these incidents are not typical of everyday practice in many clinical areas so students may not come across these situations in clinical practice. The students also spoke about the benefit of practising resuscitation skills in a simulation. For example, Jill and Bailey said:

> *I'd never really realised how CPR goes in a clinical situation before. After that knowledge, I was kind of scared that I didn't know that before and I'd been on placement without that knowledge. Like I knew how to do CPR, but not in a clinical setting with the trolley and stuff like that … I was happy that we that we did it [simulation] because then I knew I had the knowledge of how to implement it in placement* ***[Jill]***

> *That one about the ambu bag [bag-valve mask], that was definitely an 'ah ha' moment of connecting the dots … learning about actually ventilating, that you have to get the air in the lungs … like we'd been studying that you know … but then when we had to put oxygen on that patient … Respiratory depression is something that I've always remembered about narcotics because it's something that I found quite frightening so it stuck in my head … You'd hope that no student would miss that gap of connecting that learning* ***[Bailey]***

These examples show that for Jill, the simulation highlighted her knowledge gap, increased her awareness of a nurse's responsibility in clinical practice and provided the opportunity to apply her theoretical knowledge to a clinical situation. Likewise, Bailey explained that while she knew about ventilation, it was the opportunity to use the bag-valve mask with oxygen that

helped her connect the dots. She called this an 'ah-ha moment.' Bailey and Ashley found practising the skills of resuscitation especially helpful:

> *It was learning the actual techniques to know in the situation* ***[Bailey]***

> *I think it's the practical skills, like how to hold the mask, the bagging* ***[Ashley]***

Learning to manage a life-threatening scenario in simulation is well-suited to this environment because effective resuscitation relies on correct skill technique. Likewise, there are evidence-based guidelines and algorithms to guide the management of these types of incidents (New Zealand Resuscitation Council, 2016). These algorithms offer specific criteria for repetitive and deliberate practise to achieve and maintain competence in the management of these situations. Students can also receive feedback on the quality of their ventilation and compressions by using devices such as a CPR meter.

On the other hand, in many clinical areas, critical incidents are not typical in everyday nursing practice. Students are more likely to be monitoring their patients throughout their shift. For Mary, this meant her assessments in clinical and simulation differed:

> *In those emergency ones, you kind of think everything has to be done there … just take a breath and you just kind of go for it … Sometimes in simulation you have to stop halfway through your vital signs and focus on something different … [because] the patient usually complains of something else, so you forget what you're doing and focus on what the patient is saying. Or they'll stop breathing, so you think, oh better stop here … I find assessment easier in clinical. I can do it step by step. I've never come across a time [in clinical] I've had to stop halfway*

This example from Mary suggests her assessment of the patient in simulation was not her clinical reality. This difference is perhaps not surprising because Mary's most recent clinical placement was in an acute-care setting where the majority of her shift was spent at the bedside monitoring acutely unwell patients. In comparison, in the resuscitation simulation, she was required to assess a rapidly changing patient situation. Jill and Keegan also talked about different assessments:

> *In [clinical], in the morning, you go and do your obs. [vital signs] and they've usually just woken up and you don't have too many complaints. 'How did you sleep?' 'Oh not bad' and then you progress throughout the day … you have your handover and work through what you're going to do for the day and what's important … In simulation, you don't go in in the morning and wake them up, it's just a snapshot of time that you're working with and pretending that you've been with that patient for a whole week* ***[Jill]***

> *[In simulations] you've got less than 30 minutes to go in and build trust with this patient and get what you need to know. I know there are situations where you need to do that but in most mental health settings, you work with people for a very long time and the information comes out slowly* ***[Keegan]***

These examples from Jill and Keegan illustrate an ongoing assessment, which is typical in clinical areas with acutely unwell patients who require monitoring. Other types of assessment may be undertaken depending on the situation. For example, if a nurse detects a change in the patient's condition, the assessment will be problem-focused. A patient who is rapidly deteriorating requires an emergency assessment, which involves a quick appraisal of the airway, breathing, and circulation (ABC). A new patient admission necessitates a more comprehensive assessment (Bickley & Szilagyi, 2016). Although the students were taught these four types of assessment during their nursing degree, their assessments in simulations were mostly problem-based or emergency because seven of the scenarios involved a deteriorating patient.

In the clinical environment, the patient situation informs the assessment undertaken. Sometimes, the nurses will assess in a snapshot of time and at other times their assessment is ongoing. Nursing students need to understand the different assessments and when each one might be appropriate. However, for these students, many of their assessments in simulation were emergency or problem-based because these types of assessments suit the simulation timeframe. To avoid a theory to practice disconnect, the facilitator could contextualise the students' simulation experiences to the assessment of patients in clinical practice. The following clinical story from Keegan illustrates the importance of contextualisation:

> *We had a patient return from theatre with a PCA [patient controlled analgesia] on Fentanyl … The first set of observations we did were normal …*

> *It was during this second count I noticed that her breathing wasn't regular in the sense that she might breath regularly for 3 or 4 breaths, but then it might take longer to get her next breathe in. The patient, although sedated, remained fully orientated and was easily rousable. Following this, we removed access to the PCA from the patient and informed the senior nurse … At the time I wasn't too stressed about an opioid overdose and had I been on my own, I probably would have left the patient with access to the PCA. I was lucky my preceptor was there.*

Three weeks before this clinical situation, Keegan participated in a simulation of a patient who went into respiratory arrest due to receiving narcotics. One of the learning objectives for this simulation was students would 'recognise the signs of a potentially life-threatening situation' (Appendix F). The simulation begins with an assessment of a postoperative patient who has just returned from the post-anaesthetic care unit. The patient becomes sedated, breathing slows and then the patient goes into a respiratory arrest. In the follow-up interview, Keegan was asked if during the clinical incident, she recalled this simulation. She replied:

> *Could of, but it wasn't at the forefront of my mind … there were quite obvious differences, like she [patient in clinical] was still alert and conscious. It was just a matter of letting the senior nurse know and ask what she thought we should do … It wasn't a full on, call a crash team or anything like that. There were probably bits of it that you could apply … probably when someone's on opioid, you're monitoring respiratory rate, level of consciousness. I guess that's what we were doing … but then you're kind of looking at her [clinical patient] and saying, 'okay, well she's still alert, so it's not dire straits yet'.*

This story suggests Keegan may not have recognised the similarities in the simulation and the clinical situation. A possible explanation is that Keegan experienced paralysing anxiety during simulation, which influenced her learning (see chapter four). Another explanation could be Keegan did not associate the two situations because the simulation ended in a respiratory arrest, whereas the clinical situation did not. What is less clear is why, in the clinical situation, Keegan did not connect a decreasing respiratory rate to the use of narcotics, which was an objective in her simulation three weeks prior. It also raises a question about Keegan's takeaway message after the simulation. Did she think all patients who receive an overdose of narcotics will

respiratory arrest? If the simulation did not progress to a respiratory arrest, would her takeaway message have been different? Although answers to these questions are uncertain, what is evident in Keegan's story is, at the time of the interview, she understood the potential for a narcotic overdose to cause sedation.

Keegan's clinical story reminds educators that learning is not necessarily complete when debriefing ends. Instead, the learning may be consolidated at a later stage, for example, when the student has some time and space to reflect on their experience, or encounters a similar situation in clinical practice or in a future simulation. To help students consolidate the simulation, educators could use every opportunity to connect the simulation and clinical experiences. For example, in the simulation briefing and debriefing, the facilitator could highlight differences and similarities between the simulation and the clinical context in which the students regularly practice. The facilitator could also help students think about the representative nature of the simulation and encourage them to consider the various contexts in which they might apply this learning. In addition, when the student is in clinical practice, they could be asked to reflect on previous simulations and when in the simulation, encouraged to discuss their clinical experiences.

Keegan's story also suggests educators cannot assume the students experience the simulation the way it was intended. Therefore, during the simulation debriefing, facilitators should seek students' interpretations of the scenario. Educators can also not assume that students' learning in simulation will automatically transfer to the clinical setting (Nash & Harvey, 2017) as transfer may be problematic for novice learners if the two situations are contextually different (Schunk, 2012). Merriman, Stayt, and Ricketts (2014) suggest that, in a contextually different clinical and simulation scenarios, nursing students may need to decontextualise their simulation knowledge to meet the demands of the clinical situation.

CONCLUSION

This chapter explored participants' experiences in the simulation and clinical environments. The purpose of this chapter was to understand what these two contexts offer the student in regards to clinical judgement development and consequently how educators might use simulation more effectively. Four themes that highlight different ways in which the students experienced simulation and clinical practice as learning contexts were presented and discussed;

knowing the patient, the messy reality of clinical practice, feelings of responsibility and experiencing critical incidents.

In regards to knowing the patient, in simulation, the use of a simulator to play the patient and fixed timeframes made it difficult to see the complete picture of the patient. Some students viewed the simulation as predictable because the learning experience was progressed towards meeting learning outcomes and the endpoint typically involved resolution. Equally, demonstrating relational care was challenging for some students because the patient/nurse interactions were not real. By contrast, in clinical practice, students cared for patients over an extended period and, as a result, came to know the patient as a person. These interpersonal relationships induced a range of emotions, which informed the students' responses.

This finding suggests that while strategies can be incorporated into a simulation to provide a holistic patient picture, relational care is more difficult to replicate because simulations lack emotional connections with a real patient. This lack of emotional connections means a student's response in simulation may not be an accurate reflection of their actions in clinical practice. Further, because interpersonal and social cues are lacking, the patient picture is incomplete, which has the potential to affect how the student interprets the situation. Therefore, to develop nursing students' clinical judgement, educators need to continue to explore ways to add more of the patient story to the simulation. Educators also need to consider that the student's response may differ in the two learning environments and that cue recognition may be difficult. These two factors should be taken into account when planning how simulations can best be used in the nursing curriculum to develop students' clinical judgement skills.

Concerning the messy reality of clinical practice, the students shared many stories that illustrated the complexities of patient care. Reflecting on these situations helped the students learn about their emotional response and yielded rich learning opportunities. Although the students also reflected after their simulation, this reflection tended to be teacher and outcome-driven. In terms of clinical judgement development, this difference is potentially significant because it suggests reflection after simulation teaches students what they need to know. By comparison, reflection in clinical practice, especially after an emotionally charged incident, helps students learn about their response. These students' experiences also suggest that while both learning environments contribute to clinical judgement development, the learning is different. In simulation, the students can practise skills and apply their theoretical knowledge

to a clinical scenario in preparation for the clinical environment. Clinical experiences provide opportunities for students to use this learning in the messy realities of clinical practice. To develop students' clinical judgement, integrating the two different experiences in a timely way into the nursing curriculum is crucial.

In terms of feelings of responsibility, in the clinical environment, the students felt a strong sense of responsibility for their patient and, as a result, they did everything they could to care for their patient and check that their actions were appropriate. By comparison, in simulation, the patient was not real, and for some students, there was a feeling that their actions did not matter. Educators could acknowledge and discuss this potential feeling with the students in the briefing and encourage them to view the simulation as a valuable practice opportunity without the fear of patient harm. It is also important to recognise that because the patient outcome is not real, the students' responses in simulation and clinical practice might differ and this should be accounted for when debriefing the simulation or providing feedback on the student's performance.

In regards to experiencing critical incidents, participants valued the chance to practise resuscitation in simulation for two main reasons. First, they might not come across these situations in clinical practice and, if they do, the seriousness of the incident may limit their involvement. Second, effective resuscitation depends on correct technique and using algorithms put out by the resuscitation council. These algorithms offer clear criteria to practise resuscitation skills in preparation for clinical practice. On the other hand, in many clinical areas, critical incidents are not typical in everyday nursing practice and, as a result, students may experience a theory to practice disconnect if these types of scenarios are over-represented in the simulation programme. Contextualisation of the simulation experience to the reality of clinical practice is therefore crucial. Further, based on Keegan's story, the facilitator cannot assume the students experience the scenario the way it was intended. Therefore, during the debriefing session, the facilitator could ask participants what learning they might take into clinical practice and help them apply this knowledge to different contexts.

The next chapter concludes this thesis by bringing together the main findings to discuss the implications of these students' experiences for the development of clinical judgement skills. The recommendations focus on simulation design, facilitation of the simulation and curriculum integration. I also highlight the contributions of this thesis regarding the use of simulation to

develop clinical judgement in nursing students and some avenues for future research. I close this thesis with a reflection on my journey as an educator in simulation and clinical practice.

CHAPTER SEVEN: SUMMARY AND IMPLICATIONS

INTRODUCTION

This chapter brings together overall findings to illuminate students' experiences in simulation and how these compared to their experiences in the clinical environment to develop clinical judgement. The chapter also highlights the most important findings from the study and discusses the implications of this work for nursing education. The chapter begins with a summary of the key findings in relation to the two research questions. Next, the contributions of this study are highlighted and the research implications and recommendations for theory and practice are presented. The chapter concludes with suggestions for further research, an acknowledgment of the limitations of this study, and personal reflections on my doctoral journey.

SUMMARY OF KEY RESEARCH FINDINGS

Skills in clinical judgement are considered an essential nursing competency (Sommers, 2018). Traditionally, nursing students have developed these skills in the clinical environment; however, in New Zealand, finding quality learning opportunities is becoming problematic (Lesa & Daniel, 2016). Simulations are viewed as a potential solution and are increasingly utilised to cultivate clinical judgement skills. Research shows simulations are a valuable educational tool to prepare students; they are especially useful as a practice environment that has no patient risk. There is also increasing evidence that simulations are helpful for developing clinical judgement skills in nursing students. However, most of the research on simulation and clinical judgement has attempted to evaluate students' clinical judgement. The missing voice is that of the student who must demonstrate clinical judgement skills. This study placed an emphasis on the student's voice. It sought to understand the experiences of third-year nursing students in simulations and how these experiences compared to learning in clinical practice.

This research employed a qualitative research methodology in an exploratory case study of one simulation programme. The case was an undergraduate nursing school of approximately 400 students. Data collected included observations, interviews, document review and clinical stories. The nursing students' participated in 15 simulations during their three-year undergraduate nursing degree. The simulations involved participation in a clinical scenario with a group of three or four students. The simulation occurred in a dedicated room designed

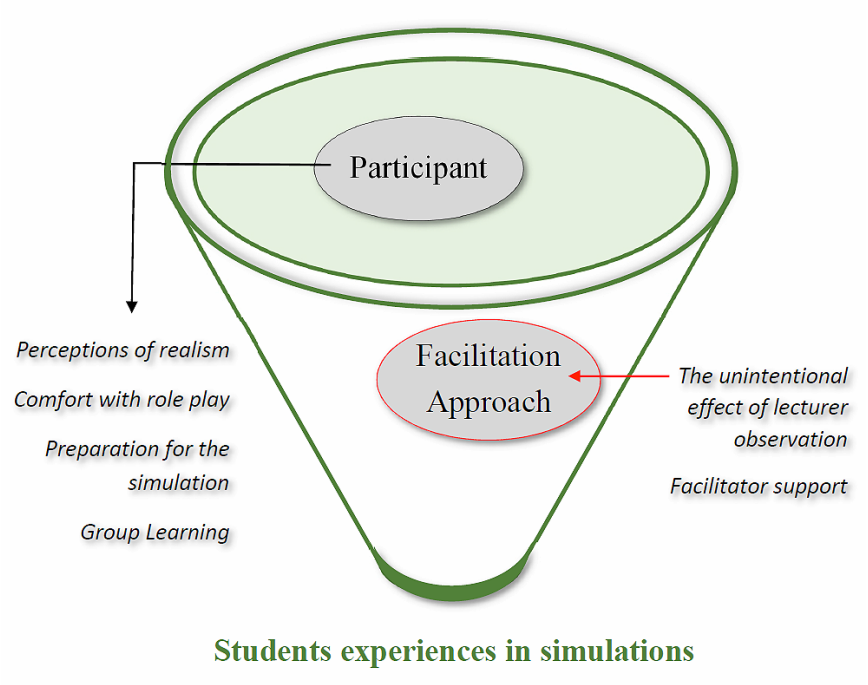
to resemble a hospital ward or outpatient clinic. The 1-hour learning experience included a 10-minute briefing, 20-minute scenario, and a 30-minute debriefing session. Students were allocated one of four roles; student nurse, registered nurse, relative or peer observer. An actor or simulator (voice provided by a hidden lecturer or technician using a microphone) played the patient. A nursing school lecturer briefed the students, observed the simulation from behind a one-way window and facilitated the debriefing session which included feedback on performance. Consequently, the analysis and claims about simulations from this research are from a very specific context.

The first research question was: how do nursing students experience simulation as an environment for learning? To answer this question, I focused on the data from my observations of 10 simulations, and data from the first interview with 12 students. The documents pertaining to the design of the simulations were also reviewed.

Figure 9 illustrates that what the participant brings to the simulation experience (chapter four) and the facilitation approach (chapter five) influenced students' experiences in simulation. For example, the students' perceptions as to whether the simulation was an authentic replication of a clinical scenario and their comfort with role-play could influence whether they leveraged the learning opportunity. The students also talked about the content-specific preparation for the simulation which they found helpful because it increased their confidence to participate. On the other hand, preparing the week before the simulation had the potential to create expectations as to how the scenario might play out. These expectations could affect what the student noticed in the simulation and their ability to adapt to the unexpected. The students also said collegiality and trust among group members was essential because the simulation required them to perform in front of their peers.

Similarly, the students spoke about the effect of the facilitation approach on their experiences in simulations, specifically, performance anxiety because the facilitator was a lecturer who at some stage, may assess their competence for nursing practice. This anxiety was exacerbated by hiding the lecturer behind a one-way window, which, for some students, created a feeling of judgement, evaluative uncertainty and a fear of making a mistake. The students also talked about wanting the feedback in the debriefing session to focus on how they could improve rather than what was not done well. This approach to feedback was important because students tended to focus on the negative aspects of their performance.

Figure 9 Students' experiences in simulation

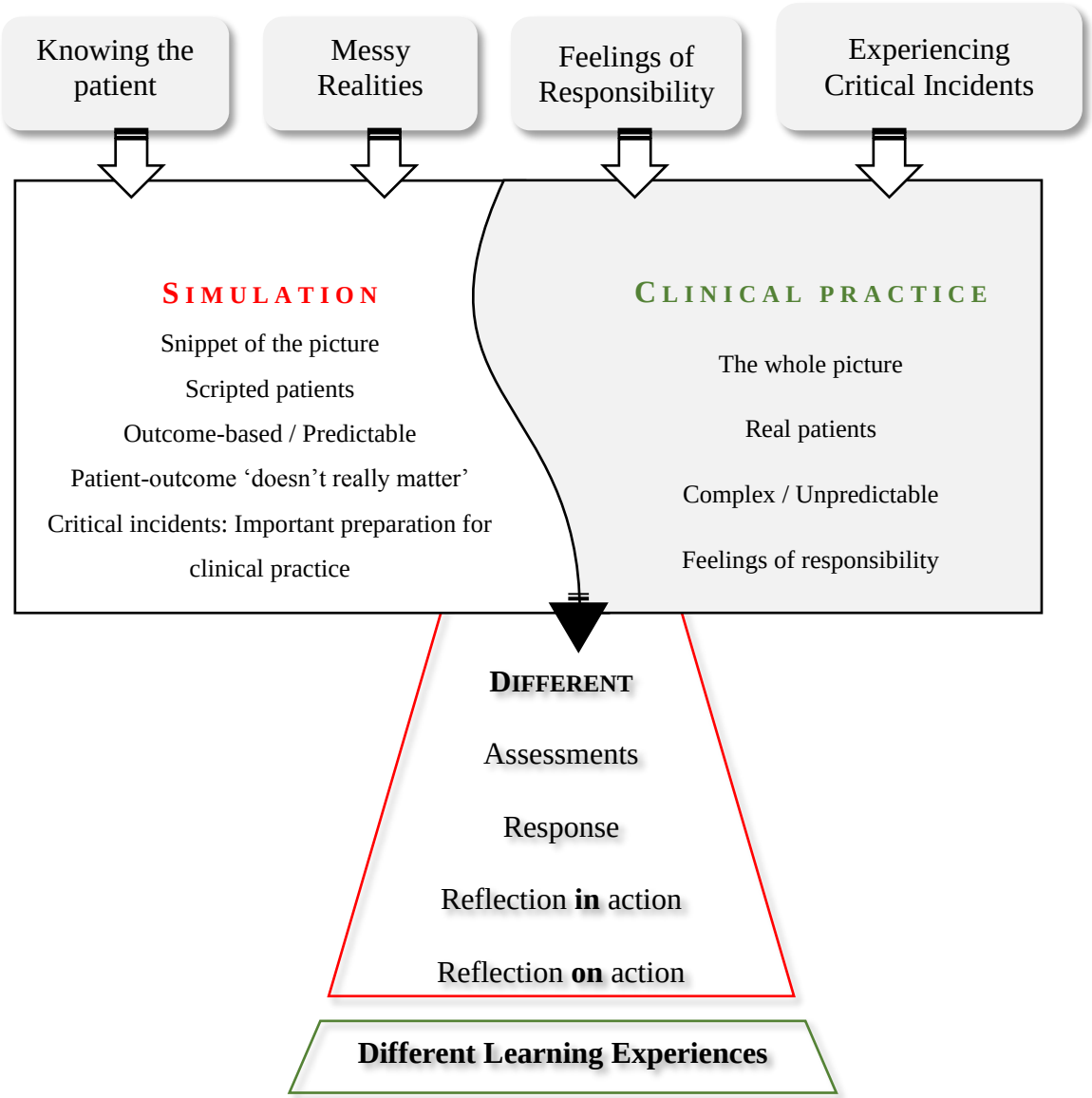


The second research question was: how do nursing students' learning experiences in simulations and clinical practice influence their development of clinical judgement skills? To answer this question, I focused on the students' clinical stories and the data from the second interview. The students' learning experiences were considered in light of the four dimensions of Tanner's clinical judgement model (2006); noticing, interpreting, responding and reflecting. The key findings are outlined in Figure 10.

The first and second row in Figure 10 show four themes that highlight the different ways in which the students experienced simulation and clinical practice (chapter six). First, the students spoke about challenges related to assessing cues on the simulated patient because the patient was not real and they were working in a 'snap shot of time'. Fixed timeframes and the limitations of the simulator to depict all the cues also influenced the students' assessments because the patient picture was incomplete. In the clinical environment, the students were in relation with the patient and accordingly, came to know and understand the patient; this added cues to the patient picture. Likewise, students were working with real patients in real situations and they connected their learning to the emotions this induced.

Second, the students shared clinical stories that demonstrated the complexities and unpredictability of clinical practice, which, for this study, were termed 'messy realities'. These messy realities differed from their learning experiences in simulations, which tended to be reasonably straightforward, predictable and progressed towards meeting learning outcomes. The messy realities of clinical practice had the potential to induce a deep personal response in the students, which may be less likely to occur in simulations because the situation was not real.

Figure 10 Students' experiences in simulation and clinical compared



Third, the students spoke about feeling a strong sense of responsibility in the clinical environment because their action or inaction affects a patient outcome. In simulation, this

feeling could be less present because the patient outcome was not real, therefore, their response 'did not really matter'. Fourth, all of the students said simulating a critical incident was important preparation because they could practise life-threatening scenarios they may not see in the clinical environment. On the other hand, because these types of scenarios were not common in the students' everyday clinical practice, educators may be over-representing the critical incident in the simulation programme. Over-representing critical incidents may unintentionally create disconnect between the students' experiences in simulation and clinical practice.

The third row in Figure 10 illustrates that the differences in the simulation and clinical environments influenced the students' assessments, responses and reflection, all of which are involved in the process of making a clinical judgement. In simulation, the students' assessments were affected by the ambiguity of cues, short timeframes and limited background information. There was also the potential to miss cues due to their expectations as to how the simulation might play out. The students' responses in the two environments differed because in the clinical environment, emotional connections with patients and feelings of responsibility informed their actions; in simulation, these feelings tended to be less present. Reflection differed because, in the clinical environment, messy realities encouraged students to reflect on their personal response. In comparison, reflection after the simulation experience had the potential to be performance-based in relation to meeting learning outcomes. The overall conclusion was students' learning experiences for the development of clinical judgement in simulation and clinical were different (row four in figure 10) yet both environments offer students valuable learning opportunities.

Based on these students' experiences, there are potential challenges associated with the use of simulations to develop clinical judgment in nursing students. These challenges are related to the created nature of the environment which affects what the student notices and this affects how they interpret the clinical situation, and therefore, their clinical judgments. Further, because the simulation is not real, the students' response may not be a true indicator of how they would behave in a real situation. This finding is important to consider because students are expected to reflect on their actions during the debriefing session and if their response is affected by cue recognition and authenticity, due to the created nature of the simulation, reflection on action and reflection *for* future practice may be difficult.

CONTRIBUTIONS OF THIS STUDY

This thesis about the experiences of nursing students in simulation and in the clinical environment makes three important contributions regarding the use of simulation to develop clinical judgement skills in nursing students. First, this study captures the student's voice and adds to the limited research on students' experiences. Highlighting the voice of nursing students who have experienced 15 simulations in the nursing degree and 16 weeks in the clinical environment adds valuable data to what is already known about using simulation to develop clinical judgement in nursing students. Second, the research findings add knowledge to the phenomena of facilitator-participant interactions depicted in the NLN/Jeffries theory (2016). It specifically addresses the influence of what the participant brings to the simulation and the facilitation approach on the desired learning outcome of developing clinical judgement skills. Third, the research findings add to the dialogue about the potential use of simulations as an alternative learning environment. Specifically, it highlights students' perspectives of their learning experiences in the simulation and clinical environment. This research is timely because nurse educators are currently interested in the possibility of substituting a proportion of clinical hours with simulations.

In summary, the students' experiences in simulation and clinical practice were influenced by what the student brings to the learning experience, the expertise of the facilitator, and the learning context. Therefore, to develop clinical judgment in nursing students, the student and facilitator must be prepared for their role (in both simulation and the clinical environment) and the educational strategy appropriate for the learning outcome. The implications of the research findings and recommendations for undergraduate nursing education are now discussed.

IMPLICATIONS OF THIS RESEARCH FOR UNDERGRADUATE NURSING EDUCATION

Based on these students' experiences, there are five implications for the design and integration of simulations in undergraduate nursing education. These implications relate to simulations with an intended outcome of clinical judgement development.

Implication 1

The first implication from these research findings is learning in simulation is complex because students are required to pretend yet respond as though the situation is real, play roles even

though it may not be their forte, and feel comfortable making mistakes. Consequently, learning in simulation can be stressful. To foster a less stressful environment necessitates a shift in the simulation culture from one of performance to one of learning. The facilitator plays a key role in this culture shift because their facilitation approach sets the tone of the simulation environment. Important facilitation strategies include careful communication with the students about expectations, acknowledgment that the simulation is not real, and encouraging students to use the fact that it is not real to their learning advantage. Stationing the facilitator alongside the student rather than observing from behind a window may also reduce the students stress in simulations.

Implication 2

The second implication is that when learning is facilitated through one-way observation, it tends to trigger performance anxiety because students cannot see the body language of the observer. For a beginning student, one-way observation may be particularly challenging because they are separated from the expert who can help them recognise salient features of a situation, interpret them and respond appropriately (Benner et al., 2009b). If the student feels they cannot access the support they require, they may become overwhelmed and, if the anxiety is significant, this will affect their performance and interfere with learning (Al-Ghareeb, Cooper & McKenna, 2017).

When this research was conducted, providing guidance from hidden observers tended to be the norm (Meakim et al., 2013). However, the recently updated INASCL standards of best practice: Simulation™ Facilitation (INACSL Standards Committee, 2016d), recommend that the facilitation approach be appropriate to the competency level and experience of the participant. This best-practice standard reflects the findings in this study because, although the students were in the third-year of their nursing degree, they still needed the support and expertise of the facilitator. These participants' experiences are also consistent with the argument of Josephsen (2015) that simulations may increase anxiety and induce cognitive overload, which is not conducive to developing clinical judgement.

Implication 3

The third implication is that in simulation, the facilitator needs to consider the effect of making a mistake because, for some students, a feeling of failure may overshadow the learning opportunity. Educators should also consider and plan for an unexpected emotional response

during the simulation, or in the debriefing session. Janzen et al. (2016) suggests some potential strategies. These include encouraging self-care for facilitators and students; creating safe spaces for facilitators and students to interact; having a co-facilitator in the debriefing session; drafting risk-management policies; normalising stress as part of the clinical experience; having facilitators' on-call to assist if needed; and, providing emergency contacts if a student needs psychological or medical attention. While these strategies are important, they are also resource intensive staff-wise and implementing them may be fiscally problematic for some nursing schools. Therefore, educators need to consider on a case-by-case basis which simulations are most appropriate for the simulation environment and prepare for the potential of an emotional response in both the clinical and simulation settings.

Implication 4

The fourth implication is those who facilitate simulations need preparation and coaching by an expert to teach in this environment because simulations are quite different to other teaching and learning situations. This finding is consistent with the INACSL Standards of Best Practice: Simulation ℠ Facilitation (INACSL Standards Committee, 2016d), which states that the facilitator should be trained, and have the skill and ability to assist students to achieve the learning outcomes. However, based on the findings in this research, the facilitator also needs the ability to respond creatively to the needs of the students during the simulation experience and in the debriefing session. I refer to this characteristic as 'adaptive expertise.' Adaptive expertise refers to the facilitator's ability to use debriefing frameworks but also the skill to adapt their facilitation to the changing situation and the response of the students; this finding aligns with recommendations in the literature (Cheng, et al., 2016; Kelly & Guinea, 2018). This approach may require the facilitator to digress from the learning outcomes, which could cause tension, especially if the outcomes are examinable. Responding to the individual needs of the student is crucial because, although teaching can be structured, learning is dependent on the response of the individual. In addition, if there is a requirement to teach for clinical judgement, such an aim will often be seen as more important than achieving other specific outcomes and competencies and so prioritised.

The preparation of the facilitator should also include skills in the management of group processes. In particular, how to recognise unhealthy group dynamics and how to manage this if it should arise. The facilitator may also need to role-model vulnerability if they expect this

from their students. For example, they could share stories about their mistakes or near misses in clinical practice to reassure students mistakes do happen, and simulations offer a place to learn from these. In summary, expert coaching into the role of facilitation is crucial.

Implication 5

The fifth implication is students' learning experiences in simulation and clinical practice are quite different yet both environments offer valuable learning opportunities for the development of clinical judgement. Simulation provides students with opportunities to develop their skills in a controlled learning environment without the stress inherent in clinical practice. Simulations can also be designed to meet the developmental stage of the student. In comparison, learning in the clinical environment offer students the opportunity to use these skills in complex and unpredictable situations. Therefore, both simulation and clinical experiences are crucial teaching and learning strategies during the nurse's education. The key to developing students' skills in clinical judgement, is ensuring both simulations and clinical practice are correctly placed in the nursing curriculum.

In summary, similar to other learning environments, designing and implementing different educational strategies in simulation will appeal to various students' expectations and diverse learning needs (chapter four). How the simulation experience is facilitated (chapter five) and the design of the simulation (chapter six) are equally important.

RECOMMENDATIONS FOR UNDERGRADUATE NURSING EDUCATION PROGRAMMES

Based on these students' experiences, there are seven recommendations for undergraduate nursing education to foster students' development of clinical judgement skills. The first six promote educational strategies for simulations with an intended outcome of clinical judgement development in nursing students. The seventh recommendation relates to curricular integration. Although the focus of this research is nursing education, these recommendations may also be useful for other health professional education programmes.

1) The first recommendation is that the facilitation approach needs to be one that encourages experimentation and reduces the fear of making a mistake. Possible strategies include using a facilitator who does not hold assessment responsibilities for students in the nursing programme or providing students with opportunities to practise without the lecturer present. Another suggestion is designing simulations with the primary purpose of 'play' and a secondary goal

of learning (a common strategy in the virtual world of gaming). As students' progress through the degree, complexity and unpredictability could be introduced into the simulation experiences to teach students about the seriousness of clinical practice and prepare them for the reality of patient care. An innovative simulation design that may address the fear of observation and encourage active participation is the use of a tag-team approach (Levett-Jones at al., 2015). This approach enables participation in an unfolding clinical scenario for up to twenty participants. Students can practise their clinical reasoning and response to the clinical situation and also share the responsibility for their actions and outcomes of the simulated patient.

2) The second recommendation is to provide novice learners with access to an expert nurse during the simulation experience. Being able to access this expertise when they are unsure what to do is particularly important. Casting another student in a similar year level in the registered nurse role, may not provide enough support for a novice learner. Hiding the person who will provide feedback behind a one-way window is not recommended, especially if the purpose of the simulation is a formative learning opportunity. However, as the student progresses through the degree, opportunities to practise without interference from a lecturer may be appropriate.

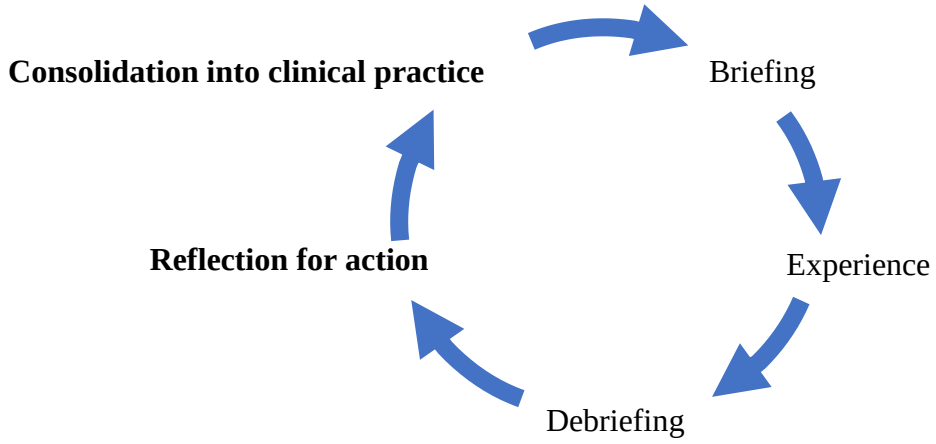
3) The third recommendation is to scaffold the level of facilitator support in simulations to the development stage of the learner. This could involve providing a high level of support and cues to a beginning student and gradually decreasing and withdrawing this support when the student is ready. For beginning students, role-modelling the expected performance may increase their confidence to participate (Lasater et al., 2014).

4) The fourth recommendation is to employ strategies to decrease the risk of unhealthy group dynamics. For example, allowing students to select their groups and using groups made up of students at different year levels, or other health professions. The tag team approach mentioned above (Levett-Jones at al., 2015) may also decrease competitiveness as students' can tag their peers into the scenario to share the decision making. Strategies such as these may reduce competitiveness and provide a platform for collaboration, role-modelling and support. Competitive behaviour may also be reduced to some extent if a lecturer with assessment responsibilities for students is not present. However, even without the pressure to compete, group dynamics may still exist. Therefore, educators should be vigilant in their observations that suggest a student is disadvantaged because of the interactions within the group. Educators could also use group-work to help students learn about team-work in the clinical setting.

5) The fifth recommendation relates specifically to the challenges of using simulation to develop clinical judgement in nursing students. As highlighted on page 143, students may find it difficult to reflect on action or, reflect *for* action, because their response may be affected by cue recognition and authenticity due to the created nature of the simulation. Designing a realistic simulation to assist students immerse and using a wide range of modalities to help students see a more complete picture will likely help to some extent. Examples include using unfolding case studies that evolve over time, asking students to suggest or create scenarios they have experienced in clinical practice, and designing flexible simulations that do not hold tightly to set learning objectives. Educators also need to acknowledge the limitations of the simulation in briefing and debriefing, and encourage students' to leverage the learning opportunity. When providing feedback, educators need to consider the effect of the created environment on the student's actions and help students apply their learning to the reality of the clinical environment.

6) The sixth recommendation is to implement a fourth and fifth phase (reflection *for* practice and consolidation in nursing practice) to the simulation experience. The typical simulation design of briefing, learning experience and debriefing (Jeffries 2016), does not take into account that students may need time and space to reflect *for* action and consolidate their learning in the context of patient care. Students reflect *in* action (while they are engaged in the learning situation) and *on* action (looking back on experiences). However, reflection *for* action is about what will be necessary for future learning and practice and it is this plan that should be tested in clinical situations. If an expert facilitator supports students during these fourth and fifth phases, this may support the transfer of learning to clinical practice and enhance clinical judgement. Potential strategies in this reflective *for* action phase include having a person available for the students if the simulation has the potential to induce an emotional response, providing post-debriefing reflection opportunities— either in groups or self-written work—and offering repeats of the scenario or clinical practicums soon after the simulation experience. Educators could also seek out moments to relate simulation and clinical experiences at every opportunity. Figure 11 depicts two additional phases to consider when planning how to integrate clinical and simulation experiences into the nursing curriculum.

Figure 11 The addition of phases four and five



7) The seventh recommendation is to scaffold simulation, clinical experiences and facilitator support during the three-year degree, which recognises that clinical judgement takes a long time to master and requires appropriate support. For example in the first year, educators could add an element of play to the students' simulation experiences. As the student progresses through their degree, they could be offered more clinical experiences with increased lecturer support in the way of situated coaching. Situated coaching by a lecturer or expert nurse is particularly important in the final weeks of the nursing degree as students are still advanced beginners and require support to recognise salient features of the situation, interpret, respond and reflect (Benner et al., 2009b; Jessee, 2018).

SUGGESTIONS FOR FUTURE RESEARCH

These research findings highlight five areas where future research is needed in the specific context of this case study. These questions may also have relevance to similar types of simulation education and theory. First, students' experiences of personal risk in simulations warrant further investigation. Reducing a sense of personal risk in simulation is essential if the desired outcome is clinical judgement development because students need to feel they can experiment without fear of making a mistake. In this context, the effect of the hidden facilitator also requires more exploration.

Second, the role of the facilitator in simulation requires further exploration. Specifically, what level of facilitator support do novice learners require in simulations and what attributes does a facilitator need to support students to attain learning outcomes effectively? The role of situated

coaching to develop students' clinical judgement in simulation and clinical practice is also important to understand.

Third, the effect of group dynamics and participants' attributes on the students' engagement in the simulation requires further investigation. In particular, motivation associated with role allocation; prior experiences; perception of realism; preparation; and expectations. The management of a powerful emotional response in simulation is currently under explored.

Fourth, more research is required in regard to the relationship between the clinical environment and simulations. An understanding of what the simulation and clinical environments offer the students in terms of learning opportunities can add to the dialogue about how simulations and clinical practice can best be used in the nursing curriculum and whether there is the potential to substitute a proportion of clinical hours with simulations.

Five, more research is recommended in regard to the best use of resources to meet the desired educational outcomes of the simulation. Educators have access to a wide range of simulation modalities and the costs of these vary enormously. If the same educational outcome can be met with less expensive resources there may be an increased uptake of the use of simulations in nursing programmes. Therefore, a cost-benefit analysis is required. Specifically, how can we decrease cost and increase the educational value of simulations? These are both political decisions and questions for the educational technologist.

LIMITATIONS

This study has provided some insights into students' experiences in simulation and the clinical environment. However, there are limitations to acknowledge. First, this study represents simulations in a single nursing school; therefore, the recommendations or implications might be limited as this is an in-depth exploratory case. Generalisation of the findings while appealing, is undesirable as it is a qualitative study. Likewise, transferability of the findings to another setting may equally be limited because various nursing schools design simulations differently and they encounter different challenges. Readers must decide for themselves whether or not what they learn from this work is transferable to their educational contexts.

Second, there are many types of simulations and these can produce different learning experiences. Therefore, the findings in this study do not apply to all forms of learning in simulation. Moreover, the findings in this study were captured in a snapshot of time in the fast-

paced moving technological landscape of education and healthcare. Future healthcare and simulation technology will undoubtedly look very different, and generations exposed to this technology will respond differently. Therefore, if this study was repeated in the future, the students' experiences are likely to be different.

Third, the findings in this study relied on my observations of the simulations, as well as interviews and written narratives from the participants. Therefore, my analysis partially depended on the fallible nature of memory. Students may also have behaved differently in the simulations I observed, because of my presence. In addition, my prior responsibilities as the simulation coordinator and lecturer in the nursing school may have biased responses in the interviews. In chapter three, I outlined the steps taken to ensure that the conclusions derived from this data were as credible as possible despite my situated perspective.

Fourth, I did not interview or observe all of the third-year students in the nursing programme. Therefore, this study presents the views of those who agreed to participate. I acknowledge the potential to attract participants who have strong personal views about learning in simulations. Further, 11 of the 12 participants were New Zealand European, and only one participant was male. A more culturally and gender diverse participant cohort may have added a broader perspective as culture and gender may influence teaching and learning preferences and impact how comfortable a student feels in the simulation environment.

CONCLUSION

In her seminal theory, 'from novice to expert,' Benner (1984) describes five development stages of a nurse; novice, advanced beginner, competent, proficient and expert. Competency in clinical judgement requires many hours of clinical experiences, more than are available to students during their three-year nursing degree. Therefore, at graduation students are most likely to be at the developmental stage of advanced beginner. At this stage, nursing students still need support from a competent, proficient or expert nurses because they may not recognise meaningful or recurrent patterns in their clinical practice and, therefore, cannot sort out what is important in the situation (Benner, 1984).

When planning simulation and clinical experiences, the developmental stage of the student is important to consider. Novice learners must first learn context-free rules and learn about situations regarding objective attributes such as measuring vital signs. Simulations are especially valuable for an early stage learner because they provide opportunities to practise

clinical skills in a controlled learning environment without the stress inherent in clinical practice. However, as the student's knowledge and skill increases, they need opportunities to use their theoretical knowledge in the context of real patient care to progress towards competence.

Reflecting on Benner's (1984) development stages for nursing students, my thoughts are that in the early years of their education, students require less exposure to real clinical situations and more simulations. For a novice learner, simulations are useful because the student may be unaware of what they do not yet know and could, therefore, pose a risk to patients. Simulations also offer novice learners the opportunity to engage in deliberate, repetitive practice, to develop skill, ability, and knowledge (Jeffries, 2016). Teaching best-practice rules and guidelines for patient care may be just enough at this development stage because educators can only give students so much information at any given time. It is only as the novice student gains more knowledge and experience that they may be able to individualise these best-practice guidelines. Providing novice learners with straightforward case studies to problem-solve is also appropriate at this early stage.

Both mastery learning (deliberate, repetitive practice) and straightforward case studies align well with emerging technologies, such as virtual simulations, because these strategies offer students immediate feedback on their performance. In these types of simulations, students can continue to practise until they feel competent and, when ready, a lecturer can provide feedback and help students contextualise their learning to clinical practice. Online learning platforms are also useful for novice learners because students can gain knowledge in their own time, with less input from a lecturer. However, as students progress through their education, they require clinical opportunities to step up in terms of what it means to be a nurse. It is at this point that students need to feel more responsibility, level of stress, and personal risk. Experiencing this clinical reality becomes even more important as the student approaches graduation because in the clinical environment, students learn how to manage their personal response to the messy realities of real patient care. Undergraduate nursing educators are in a unique position to build on the students' experiences in simulation and clinical practice over three years. Educators can, therefore, scaffold simulations, clinical experiences and lecturer input to grow nursing students' clinical judgement skills during the three-year degree.

In New Zealand, nursing students are required to undertake a final nine-week clinical placement at the end of the degree to support the transition to practice. The amount of lecturer support students receive during this nine weeks differs among nursing programmes; however, in the nursing school in this study the lecturers tended to be quite hands-off during this placement unless there was a problem. The reason for this approach could be related to the fact that students were about to graduate and required opportunities to work independently, use their initiative and make decisions (Löfmark & Wikblad, 2001). Notwithstanding this, transition to practice placements are an excellent opportunity to provide students with coaching from skilled facilitators because the student has more knowledge, skills and experience to draw on. Although the registered nurse may provide some of this coaching, they have a clinical workload to manage and must prioritise patient care over student learning (Hunter & Arthur, 2016). An increased presence of the lecturer in the clinical setting in the final stage of the degree may lessen the load on the registered nurses and provide students with the expert coaching required to continue to grow their clinical judgement skills, in preparation for the transition to a registered nurse.

In closing, in all teaching and learning situations there is a learner, a teacher, and an educational strategy. The success of the educational strategy depends on the skill of the facilitator and the willingness of the participant to learn. For example, to develop clinical judgement skills, students need coaching from an expert whether they be in a simulation or in the clinical environment. If a student is not motivated to learn or lacks confidence, this has the potential to affect attainment of learning outcomes in any teaching and learning situation. Therefore, educators must continue to explore effective teaching and learning practices in both the simulation and clinical environment to provide the best possible learning outcomes for nursing students. Otherwise, students may be underprepared for the demands of the increasingly challenging and unpredictable healthcare environment of today.

REFLECTION ON MY DOCTORAL JOURNEY

As described in the opening chapter, a growing dissatisfaction with the changes I experienced in my education role led to this research inquiry. Specifically, I was concerned that the current approach to teaching and learning might not prepare students for the complex healthcare environment of today. My questions were about how educators could cultivate clinical judgement skills in nursing students and how the simulation environment influenced the emotional response of the students.

As I reflect on my four-year doctoral journey, I realise the opportunity to hear about the students' experiences in simulation has not only answered my research questions, it has greatly enhanced my facilitation in the simulation environment. Two memorable moments led to this realisation. The first was when I was facilitating a simulation for 17 first-year nursing students. We were all in the simulation room together and I asked for two volunteers to play the role of the student nurse in the clinical scenario. The students were reassured that I was there as a registered nurse to support them. Three students willingly volunteered to play the role despite needing to perform in front of myself as a lecturer (with student assessment responsibilities in the course) and in front of all of their peers. Throughout the semester, students continued to readily take lead roles. As I reflected on the students' willingness, it was clear to me fostering a comfortable environment where students are happy to experiment was indeed possible.

The other moment occurred during a simulation about seizure management. The patient (another lecturer) began to seize (acting) and I found myself going into autopilot and behaving as I would have when I was working in a neurological unit. Before this incident, I was reasonably sceptical about the role of immersion in simulation. This experience was meaningful in my journey as I began to realise the potential of simulations. What was particularly interesting, was minimal resources were used to reach this immersive state. This experience was just one of many valuable learning moments for myself and the students, as I strived to incorporate best simulation practices into my teaching and learning philosophy.

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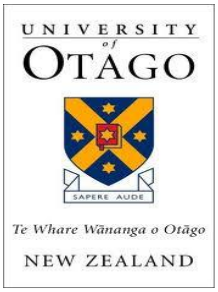
APPENDIX A



HIGHER EDUCATION DEVELOPMENT CENTRE
Te Wāhanga Whakapakari i Te Whare Wānanga

Letter to Head of School

Date: November 14th 2014

Dear --------

I am writing to ask for permission to undertake research with the third-year nursing students in ---------- Nursing School in 2015. This research has been approved at departmental level at the University of Otago, however before I progress to the next stage of applying to--------- Ethics committee I would like to first seek your approval for this research.

The aim of my PhD research is to explore the experiences of third year nursing students in simulations.

Research questions

1. How do third-year nursing students experience simulation as an environment for learning?
2. How do students perceive learning clinical judgement in simulations compares with learning clinical judgement in clinical practice?

Brief description of the method

An exploratory case study describing third year nursing students' experiences of learning clinical judgement has been chosen to accomplish the aim of this research.

During the 3rd year of the nursing degree at ----------students undertake six simulated learning experiences in small groups over a four week period and complete four clinical placements. During the four weeks when the first cohort of 30 nursing students are participating in their

simulated learning experiences the researcher will observe these simulations and undertake focus groups with the students.

Following their simulated learning experiences this same cohort of students will undertake four weeks of clinical practice in a mental health placement and four weeks in a medical/surgical placement. Students who consent to participate in phase three of this research project will be asked to keep a journal to record narrative stories of their experiences of working with patients and making clinical judgements in either their mental health clinical experience or medical/surgical experience. At the end of the clinical placement the researcher will interview these students to explore their experiences of learning clinical judgement in clinical practice and discuss the stories recorded in their clinical journal.

If you are happy for me to proceed, I will supply you with the full ethical proposal when this is prepared for the ethics committee. This proposal will explain in-depth the recruitment methods, informed consent and other issues. You are welcome to provide feedback in regards to this ethics proposal and we can discuss any concerns you may have.

Sincerely

Raewyn Lesa RN MN GCTL PhD Candidate

APPENDIX B

VSR Interview Questions for participants

Questions

1) Can you tell me about your experiences of developing clinical judgement skills in simulations?
2) Can you describe your thoughts and feelings during the pre-briefing session
3) Can you tell me about your thoughts and emotions you had as you were about to go into the simulation room?

Watch video

Questions after video if time

1) Can you tell me about your thoughts and emotions you experienced in the simulation?
2) Describe any differences/similarities between the mental health and medical surgical simulations
3) What are your thoughts as to how this experience may influence your clinical practice
4) What did you think about using the video recall as a method of reflecting on the scenario?

Any comments?

APPENDIX C

Interview Questions for Participants who were not video recorded

Questions

1. Can you tell me about your experiences of developing clinical judgement skills in simulation?
2. Can you describe your thoughts and feelings during the pre-briefing session?
3. Can you tell me about your thoughts and emotions you had as you were about to go into the simulation room?
4. Can you describe your thoughts and emotions during the simulation?
5. What were your experiences of the debriefing session?
6. What are your thoughts about how simulations influence your clinical practice?
7. Describe any differences/similarities between the mental health and medical surgical simulations
8. Any comments?

APPENDIX D

Second Interview Guide

- Demographics
- Review Stories

Questions

1. Can you tell me about experiences have helped you develop clinical judgement skills in clinical practice?
2. Can you tell me about differences/similarities between your experiences in simulations and clinical practice?
3. How does your role as a student nurse in the clinical setting compare to your role as a student nurse in the simulation setting?
4. Can you give examples of using knowledge and skills gains in simulation in clinical practice?
5. How does your assessments of patients in clinical compare to assessment of patients in simulation?
6. How does reflection during clinical compare to debriefing after simulation?

- Discuss transcript from first interview

APPENDIX E

Clinical Journal Guide

The aim of the clinical journal for the research is for you to tell the story of a clinical encounter which required a response from you. You do not need to include literature in the stories you send me. You may need to include literature if the reflection is going into your portfolio.

The situation can be a physiological patient problem, a situation involving a patient/client's family, an ethical issue or anything else that required a response from you. Your stories can be small or in- depth, no minimum or maximum words.

Describe the situation. Within this description of the situation you may like to include:

- what you noticed initially and as the situation progressed
- what you thought about the situation
- any emotions you had about the situation

Describe your response. Within this description of your response you may like to include:

- What your observations and data interpretation lead you to believe about the situation
- The response from patient/client, family or staff
- Your feelings as you responded to the patient or others involved in the situation

Reflect on this situation. Within this reflection you may like to include:

- Any similar situations you have encountered in simulation or clinical before; similarities and differences
- Support/ involvement of the preceptor
- What you have learnt from this experience and how your future practice may change.

APPENDIX F

The scenarios

<table>
<tr><td colspan="2">Title: Opioid Intoxication Patient (manikin, voice by technician) Doctor (played by Facilitator)

Roles: 1) Primary nurse 2) Secondary nurse 3) PACU nurse 4) Peer observer</td></tr>
<tr><td>Objectives:

1) Demonstrates patient assessment and monitoring

2) Recognises signs and symptoms of respiratory depression

3) Recognises significance of reduced level of consciousness (LOC)

4) Manages this potential life threatening complication appropriately and in a timely manner

5) Prioritises & implements medical orders appropriately</td><td>Brief description

A 40yr male underwent a laparoscopic inguinal hernia repair under general anaesthesia.

Has been transferred from post anaesthetic care unit (PACU) to your ward. Has 3 small incisions, no bleeding noted. Estimated blood loss in theatre was 200mL. IV of N/Saline 1L bag in place at 125mL/hr. He has an indwelling catheter (IDC). 200mL urine output. Oxygen therapy 2L via nasal prongs.

Vital signs stable when transferred to the ward. Sleepy but wakes easily to verbal command. Pat had been complaining of severe pain while in PACU but since receiving IV morphine x 3 has stated his pain level is now 2/10. No complaints of nausea or vomiting

Commencement of scenario

Two nurses walk into the patient's room to do postoperative vital signs. Patient is drowsy, not orientated with slurred speech and low RR and then becomes unresponsive with RR of 5.</td></tr>
<tr><td colspan="2">Title: Pulmonary Embolism Patient (manikin, voice by technician) Doctor (played by facilitator)

Roles: 1) Student nurse 2) Registered Nurse 3) 2nd Student nurse 4) Peer observer</td></tr>
<tr><td>Objectives:

1) Demonstrates patient assessment and monitoring

2) Recognises respiratory distress and implements correct interventions in a timely manner

3) Prioritises and implements medical orders appropriately</td><td>Brief description

A 69yr male underwent a hemicolectomy 5 days ago. He has a midline abdominal incision without redness, swelling or drainage. Tolerating a soft diet without nausea or vomiting. Bowel sounds present in all abdominal quadrants. He had a bowel movement yesterday. Urinary output is satisfactory. Reluctant to use the incentive spirometer but his wife encourages him to do his deep breathing. Abdominal pain controlled with Tramodol and paracetamol.

Mr Watkins has refused to ambulate this morning because of fatigue and a sore leg. He is ringing the call bell requesting to see his nurse.

On entering room patient is short of breath and saying he doesn't feel well. His leg has felt sore for a day or two but didn't tell anyone as didn't think it was important. Says he can't seem to be able to catch his breath and it hurts to breathe.

Vitals signs: RR 28; HR 110; BP 130/86; O2 saturations 89%</td></tr>
</table>

<table>
<tr><td colspan="2">Title: Anxiety & substance abuse Patient (actor)
Roles: 1) Student nurse 2) RN Partner 3) Patient's Sister 4) Peer observer</td></tr>
<tr><td>Objectives:
1) Increase confidence in assessing a patient with a mood disorder (anxiety) with alcohol abuse (coexisting problems CEP)
2) Increase ability and confidence to do a Risk Assessment</td><td>Brief description:
A 38yr single Maori man presents at the Health Centre complaining of a migraine headache and fatigue.
Accompanied by sister
Feeling extremely stressed & worried about the responsibilities of his job. Has had several conflicts with employees under his supervision.
Has had trouble sleeping
Reports having a few beers and wine before he goes to bed most every night.
Feels edgy and distressed and wants to be given something to help calm his nerves, suggesting diazepam, to get him through the day. He also wanted someone to talk to.
The RN partner hands over the presentation to the student nurse to do an assessment, and make a follow up plan.</td></tr>
<tr><td colspan="2">Title: Risk Assessment /Alcohol dependency Patient (actor)
Roles: 1) Student nurse 2) RN Partner 3) Patient's partner 4) Peer observer</td></tr>
<tr><td>Objectives:
1) Assess level of suicide Risk
2) Assess for alcohol dependency
3) Assess need for supported detoxification</td><td>Brief Description
A 21yr university female student of European descent presents to emergency psychiatric services with her partner Sarah. Referred from Emergency Department (ED). She stated to ED nurse she wants to die and she will kill herself if not admitted to hospital. She currently smells of alcohol but is not obviously intoxicated.
She is becoming increasing isolated, often feels quite unwell, has difficulty remembering things so is finding it hard to complete her university work. Feels guilty and hopeless about how she is living her life
Turbulent adolescence. First started drinking aged 13. Aged 18 disclosed her sexual orientation to family and friends
Drinking over last 3 years increased to the point where she now drinks up to 2 bottles of wine per occasion on the weekends. She has not had an alcohol free day for five weeks and findings it increasing hard to have an alcohol free day. Minimum would be 3-4 large wines most days of the week
Only Sarah, her partner, knows about the amount she drinks. She does not appear intoxicated to others around her apart from the weekends when she 'parties hard'. She has a high tolerance to alcohol
History of cutting both arms and legs, but no self -harm for 18 months since meeting Sarah. No history of suicidal ideation.</td></tr>
</table>

APPENDIX G

INFORMATION SHEET FOR PARTICIPANTS

Simulations and the development of clinical judgement in undergraduate nursing students

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate I thank you. If you decide not to take part there will be no disadvantage to you and thank you for considering my request.

You are invited to participate in a research study to explore the development of undergraduate nurses' clinical judgement skills in simulations. By participating in this research you will contribute to an understanding of the role simulations play in preparing nurses for clinical practice. This research will benefit key stakeholders such as the Nursing Council of New Zealand, Nurse Educators in the Tertiary sector (NETS) and simulation decision makers as they advance the integration of simulations into undergraduate nursing curriculums in New Zealand. Establishing a simulation programme requires a substantial capital and on-going financial investment. Without a theoretical understanding, or evidence about the effectiveness of this approach to teach clinical judgement, a considerable amount of financial resource could be spent in unused or rarely used resources in health science education. In addition, this research will benefit nursing educators and students by identifying educational strategies for simulated learning environments.

What is the Aim of the Project?

This research aims to explore the development of third year nursing students' development of clinical judgement skills in simulations and during clinical practice. Data collection includes observation and video- recording of simulations, student interviews' post simulation and post clinical experience and the collection of student stories through the use of a clinical journal. This project is being undertaken as part of the requirements for Raewyn Lesa's PhD.

What Types of Participants are being sought?

Nursing students who commence their third year of study in 2015 with simulations are being asked if they would like to participate in this research project. Should you agree to participate in this research, your simulations will be observed and video- recorded, you will be asked to record stories using a reflective framework in a journal during either on your mental health or medical/surgical placement and you will be invited to participate in two 60 to 90 minute interviews.

Observation of simulations

Observation and videoing of simulations are being undertaken to describe, understand and capture the context of the simulated learning environment. The researcher will observe silently and take notes throughout the simulation scenario and during the debriefing using an observational guide. The simulation session will be video- recorded, the debriefing session be audio recorded. There is no additional requirement on your part.

Interviews

One interview will be undertaken following your simulations' and one interview will occur after your clinical experience to discuss stories in your journal. Time required from you is 60 to 90 minutes for each interview. The interview questions are mostly open-ended. If you agree to take part in this research, a copy of the questions will be sent to you before the interview. The interviews will be audio taped and notes taken during the session.

Clinical journal

To understand the development of clinical judgement in the clinical context you are been asked to record stories of making clinical judgements in a clinical journal during your mental health or medical/surgical placement. You will be provided with a journal and a copy of the "Guide for Reflection Using Tanner's (2006) Clinical Judgement Model" (Neilsen et. al., 2007) during the post simulation interview. There will also be an opportunity for you to ask questions during this time. There is no minimum or maximum number of stories required during your clinical experience, however aiming for one story a week may be a realistic goal. You are also free to record thoughts about clinical judgement development in this journal. The time required to complete this journal will vary, but my estimates are around 60 to 90 minutes a week maximum. The journal will be collected by the researcher at the end of the clinical and will be used to

guide the post clinical practice interview. Participants' may choose to use their stories in their clinical portfolios.

The audio taped interviews will be transcribed and the data analysed using an inductive analysis. The transcriber will be asked to sign a confidentiality agreement. Your confidentiality will be maintained and any identifying details modified in the thesis. Every attempt will be made to maintain anonymity. Results of this project may be published or presented at a conference, and a copy of the completed thesis will be available in the University of Otago library (Dunedin New Zealand).

The transcribed data, survey results and observation notes will be stored on the researcher's computer, password protected. The audiotapes, video recording and journals will be securely stored in a locked cabinet at HEDC University of Otago for a period of five years after which it will be destroyed. Only the researcher and two supervisors will have access to this data.

You can decline to participate without any disadvantage to yourself of any kind. If you choose to participate, you may withdraw from the project at any time until data analysis has commenced in June 2015. If you have any questions about the project, either now or in the future, please feel free to contact my supervisor or myself.

Student Researcher Raewyn Lesa raewyn.lesa@gmail,com

Supervisor Dr Ben Daniel ben.daniel@otago.ac.nz

Higher Education Development Centre, University of Otago Dunedin

This study has been approved by the Otago University Higher Education Development Centre and the Otago Polytechnic Research Ethics Committee. However, if you have any concerns about the ethical conduct of the research you may contact the University of Otago Human Ethics Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

References

Nielsen, A., Stragnell, S., & Jester, P. (2007). Guide for reflection using the clinical judgement model. *Journal of Nursing Education, 46*(11).

APPENDIX H

CONSENT FORM

Simulations and the development of clinical judgement in undergraduate nursing students

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

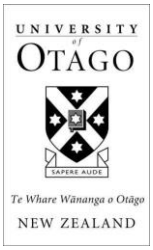
I know that:-

- My participation in the project is entirely voluntary;
- I am free to withdraw from the project at any stage until data analysis has commenced in June 2015 without any disadvantage;
- I can refuse to answer any particular question, and ask for the audio or video to be turned off at any stage;
- The transcribed data, survey results and observation notes will be stored on the researcher's computer, password protected. The audiotapes, video recording and journals will be securely stored in a locked cabinet at HEDC University of Otago for a period of five years after which it will be destroyed. Only the researcher and two supervisors will have access to this data
- The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand). Every attempt will be made to preserve my anonymity.

I agree to take part in this project.

Signature of participant) (Date)

I would like to receive a summary of the results of this research Yes No



CONSENT FOR SIMULATION OBSERVATION

Simulations and the development of clinical judgement in undergraduate nursing students

To explore the development of third year nursing students' clinical judgement skills in simulations, observation and video- recording of simulations are being undertaken to describe, understand and capture the context of the simulated learning environment. This project is being undertaken as part of the requirements for Raewyn Lesa's PhD.

As part of the recruitment group, your simulation experience may be observed silently by the researcher and notes taken throughout the simulation scenario and during debriefing using an observational guide. The simulation session will be video recorded, the debriefing session will be audio recorded.

I have read the information concerning this research and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

- My participation in the observed simulation is entirely voluntary;
- I am free to withdraw from an observed video recorded simulation without any disadvantage;
- The observation notes will be stored on the researcher's computer, password protected. The video recording will be securely stored in a locked cabinet at HEDC University of Otago for a period of five years after which it will be destroyed. Only the researcher and two supervisors will have access to this data
- The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand). Every attempt will be made to preserve my anonymity.

Please circle if you consent to have your simulations observed: **Do** **Do not consent**

....

(Signature of participant) (Date)